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Toronto Central Waterfront

TRANSPORTATION CORRIDOR STUDY



REPORT
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ROYAL COMMISSION ON THE FUTURE OF THE TORONTO WATERFRONT

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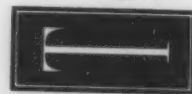
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ROYAL COMMISSION ON THE FUTURE OF THE TORONTO WATERFRONT



Toronto Central Waterfront

TRANSPORTATION CORRIDOR STUDY

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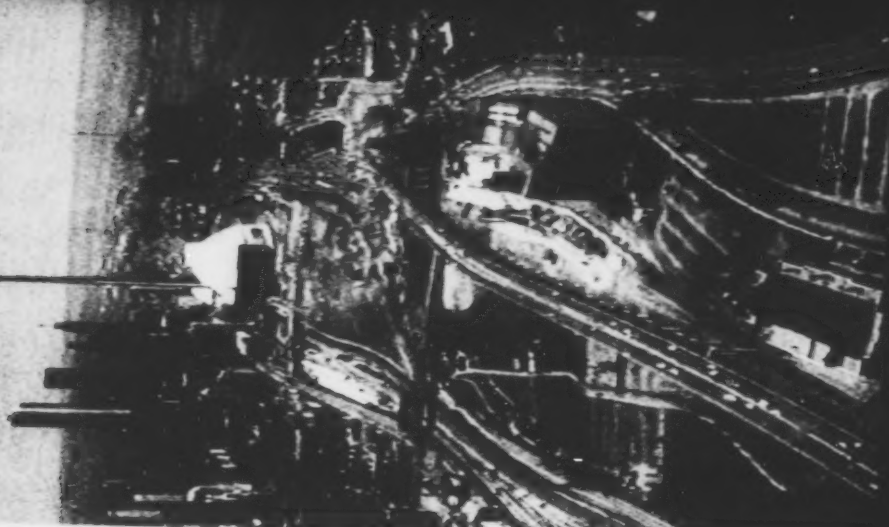
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Royal Commission on the
Future of the
Toronto Waterfront



Royal Commission on the
Future of the
Toronto Waterfront

Commissioner
The Honourable David Crombie, P.C.

Commissioner
The Honourable David Crombie, P.C.

Executive Director and Counsel
Ronald L. Doering

Executive Director and Counsel
Ronald L. Doering

Dear Colleague:

Cher collègue:

I am pleased to send you this copy of the *Toronto Central Waterfront Transportation Corridor Study*. This study is in response to a request from the Ontario Minister of the Environment, also responsible for the Greater Toronto Area, asking the Commission to address the feasibility of relocating the Gardiner Expressway in consultation with Metropolitan Toronto and the Ministry of Transportation.

J'ai le plaisir de vous faire parvenir cet exemplaire de l'*Étude sur le Corridor de Transport du Secteur Rivierain Central de Toronto*.

The report is the work of many hands. It was prepared under the guidance of a steering committee chaired by the Royal Commission and composed of senior representatives from four levels of government and the special purpose bodies in the area.

Cette étude a été rédigée en réponse au ministre de l'Environnement de l'Ontario, qui est également responsable de la région du Grand Toronto, et qui a demandé à la Commission de se pencher sur la possibilité de relocation de l'autoroute Gardiner en consultation avec la communauté urbaine de Toronto et le ministère des Transports.

The Steering Committee used the services of a team of consultants led by Mr. Neal Irwin of the IBI Group and Mr. Ed Levy of B-A Consulting Group Ltd. The Committee also established a Work Group of specialists from each level of government who collaborated ably with the consultants on the technical aspects of the report.

Le Comité directeur a fait appel aux services d'une équipe de consultants dirigée par M. Neal Irwin du Groupe IBI et M. Ed. Levy de B-A Consulting Group Ltd. Le comité a aussi établi un Groupe de Travail de spécialistes à chaque niveau du gouvernement qui ont collaboré de façon compétente avec les consultants sur les aspects techniques du rapport.

Base funding for this study was provided by the Province of Ontario. Over and above this, however, the consultant team made extraordinary efforts to ensure that a comprehensive range of policy alternatives was addressed and indeed could be said to have worked "pro bono publico".

Les fonds de base pour cette étude ont été fournis par la province d'Ontario. Qui plus est, l'équipe de consultants a fait des efforts extraordinaires pour s'assurer qu'une gamme étendue de solutions de rechange soit étudiée et on peut vraiment dire qu'elle a oeuvré "pro bono publico".

This is the last background report that the Royal Commission will publish. It is the Commission's hope that the governments will organize an appropriate procedure for public debate on the issues raised herein. The Commission will make its own recommendations on the issues in our final report in December 1991.

Ce rapport d'information est le dernier que la Commission publiera. Elle espère que les gouvernements organiseront des procédures appropriées pour un débat public sur les questions qui y sont soulevées. La Commission fera ses propres recommandations sur ces questions dans son rapport final en Décembre 1991.

David Crombie

171 Slater Street, 11th Floor / 11^e étage
P.O. Box / C.P. 1527, Station / Succursale "B"
Ottawa, Canada K1P 6P5

David Crombie

207 Queen's Quay West / Ouest, 5th Floor / 5^e étage
P.O. Box / C.P. 4111, Station / Succursale "A"
Toronto, Canada M5W 2V4

Tel. No. / No. de téléphone: (613) 990-3306
Fax No. / No. de télécopie: (613) 990-4345

Tel. No. / No. de téléphone: (416) 973-7185
Fax No. / No. de télécopie: (416) 973-7103

PREFACE

PLANS, CONSEQUENCES, AND UNCERTAINTIES

This study stresses the importance of understanding and contributing to a harmonious interaction of the **Environment**, the **Community**, and the **Economy** in developing, evaluating, and implementing plans for the future. Extraordinary changes have occurred in Toronto's Central Waterfront over the past 200 years. It is likely that the planners and builders of each wave of community and economic development considered that they were creating a long-term, stable condition on the Central Waterfront, but time and unceasing change have done their work at each stage to create new conditions, opportunities, and aspirations which rendered obsolete the developments of previous generations.

We can be sure that a similar fate will unfold for new plans and projects resulting from current efforts. There are, however, enduring values, particularly relating to environmental quality, husbanding of resources, and basic conditions for human survival, comfort, economic viability, cultural development, and quality of life, which must be given first consideration. In that context, plans and development programs seek to achieve various short-term and longer-term goals. Options should be kept open, where possible, to accommodate changing circumstances while attempting to retain fundamental values, a complex and challenging task.

Faced with this challenge, planners must attempt to be as creative as possible in developing a range of possible plans and estimating the likely consequences of each plan, while recognizing that the future is highly uncertain and brings continuing change. Strategies for the future should therefore be **robust** in terms of their ability to accommodate future conditions which may be significantly different from those considered by this generation of planners and builders to be most likely 25, 50 or 100 years from now.

The owners, operators, users, and planners of the Central Waterfront bring various value sets to bear as they consider the future. A planning exercise such as this can contribute most effectively, in our view, by showing as clearly and objectively as possible the likely range of improvements, risks, costs, and related consequences of a creative and reasonably comprehensive range of alternative plans for the future. The information so presented allows stakeholders and society at large to understand the consequences, interpret them in light of their various sets of values, and, it is hoped, make informed and fruitful decisions.



ROYAL COMMISSION ON THE FUTURE OF THE TORONTO WATERFRONT

COMMISSIONER

THE HONOURABLE DAVID CROMBIE, P.C.

SENIOR DIRECTOR, SPECIAL PROJECTS

DAVID CARTER

EDITOR

SHEILA KIERAN

STUDY CO-DIRECTORS

NEAL IRWIN
IBI Group

EDWARD LEVY

B-A CONSULTING GROUP LTD.

CONSULTING TEAM

LAND USE/URBAN DESIGN

Philip Beinhaker
IBI Group

Robert Allsopp
Du Toit, Allsopp, Hillier

Roger du Toit
Du Toit, Allsopp, Hillier

Bob Evans
IBI Group

David Gordon
The Kirkland Partnership

Marc Hewitt
IBI Group

John Hillier
Du Toit, Allsopp, Hillier

Michael Kirkland
The Kirkland Partnership

Trevor McIntyre
IBI Group

Stephen McLaughlin
Stephen G. McLaughlin Consultants Inc.

Mark Van Elsberg
IBI Group

Kenneth Whitwell
IBI Group

ENVIRONMENT

Ewen Fisher
IBI Group

Edward Chart
Decommissioning Consulting Services Ltd.

David Hopper
Angus Environmental Ltd.

Michael Hough

Hough Stansbury Woodland Ltd.

Brett Ibbotson
Angus Environmental Ltd.

Steve Schibuola
IBI Group

Maria Kaars Sijpesteijn
Hough Stansbury Woodland Ltd.

Carolyn Woodland
Hough Stansbury Woodland Ltd.

TRANSPORTATION

Robert McBride
B-A Consulting Group Ltd.

Lee Sims
IBI Group

John Barrington
B-A Consulting Group Ltd.

Giles Bailey
IBI Group

Calvin Beach
IBI Group

Ross Long
IBI Group

Scott McMillan
B-A Consulting Group Ltd.

Bruce Mori
IBI Group

Peter Noehammer
B-A Consulting Group Ltd.

Steve Shaw
B-A Consulting Group Ltd.

Richard Soberman
Richard M. Soberman Ltd.

ECONOMICS/FINANCE

Barry Lyon
N. Barry Lyon Consultants Limited

Randy Grimes
IBI Group

Parviz Dhajani
D-S Lea Associates Ltd.

Bruce Duncan
D-S Lea Associates Ltd.

Harold Kobold
D-S Lea Associates Ltd.

Horst Leingruener
D-S Lea Associates Ltd.

Anthony Miles
D-S Lea Associates Ltd.

Audrey Jacob
IBI Group

David V. Van
N. Barry Lyon Consultants Limited

Rad Vucicevich
N. Barry Lyon Consultants Limited

REPORT DESIGN

Dyan Marie
IBI Group

Neil Bradshaw
IBI Group

Brenda Burton
IBI Group

Dorothy Booth
IBI Group

Janet Taylor
IBI Group

OVERVIEW

This study envisions the Central Waterfront as an improved **place**, as the result of:

- a green infrastructure system of open spaces, parks, and links;
- positive additional steps to improve the quality of the natural environment;
- a balanced and diverse mix of residential, employment, and recreational uses;
- built form and streetscape design that are pedestrian-friendly and oriented to more livable, workable, accessible, and legible public and private spaces;
- greatly improved public transit at both the regional and local scales;
- an interconnected and balanced road network;
- enhanced opportunities for economic competitiveness and renewal; and
- infrastructure capital and operating costs that are supportable because of the economic activity created.

An important part of that vision is a redesigned and relocated Gardiner Expressway/Lake Shore Boulevard facility to help strengthen the links between the city and its renewed Central Waterfront and improve the area's quality as a **place** while maintaining and enhancing its essential function as a **corridor** serving transit, rail and air passengers, auto travellers, truck, rail, and marine freight movements, pedestrians, and cyclists.

This study sets out a range of transportation options, identifies the environmental, land-use, urban design, and economic opportunities and concepts they help make possible, and assesses the required financial resources and related risks involved; it proposes a Stage 1 program aimed at achieving those opportunities in a cost-effective manner. The combined land-use, transit system, road network, and environmental concept which could subsequently evolve would be compatible with various treatments of the Gardiner/Lake Shore facility, and the anticipated consequences of these are described. The Stage 1 program is designed to leave open the more promising options for the central section of the Gardiner/Lake Shore facility. Implementation of the Stage 1 program will provide a considerably firmer basis than now exists for deciding on the most appropriate option, while moving purposefully to create a better **place** and **corridor** in the Central Waterfront.

Major public policy issues are at stake and decisions taken (or not taken) during the next few years will greatly affect the quality of Toronto's Central Waterfront and adjacent areas for at least the next one or two generations. It is clear that a new process is needed for planning and delivering the necessary decisions, agreements, and programs to achieve the bold plan that is within the grasp of this generation.

The challenge is great. The potential rewards are infinitely greater.



TABLE OF CONTENTS

PREFACE	3
MAJOR FINDINGS	5
1. INTRODUCTION	12
1.1 BACKGROUND	12
1.2 THE TRANSPORTATION CORRIDOR STUDY	12
1.3 STUDY AREA	14
1.4 CENTRAL WATERFRONT PLAN	15
1.4.1 STRATEGIC OBJECTIVES	15
2. TRANSPORTATION CORRIDOR STUDY	17
2.1 APPROACH	18
2.2 GENERIC ALTERNATIVES	18
2.3 USING THE ECOSYSTEM APPROACH	19
2.4 PRINCIPLES	19
3. THE CENTRAL WATERFRONT AS A PLACE	21
3.1 ECONOMIC TRENDS AND CHANGING LAND USES	22
3.1.1 MIGRATION OF HEAVY INDUSTRY AND RAIL ACTIVITIES	23
3.1.2 SPECIALIZATION OF CENTRAL LAND USES	24
3.1.3 URBAN INDUSTRIAL USES	24
3.1.4 SUBURBAN RESIDENTIAL GROWTH	25
3.1.5 DOWNTOWN RESIDENTIAL GROWTH	25
3.2 A UNIQUE ENVIRONMENTAL OPPORTUNITY	26
3.2.1 GREEN INFRASTRUCTURE	26
Habitat Quality	26
Open Space	27
Green Links	27
Open Space and Links as Green Infrastructure	29
ENVIRONMENTAL QUALITY	29
Air Quality	29
Water Quality	30
Soil Quality	30
Other Environmental Factors	31

3.3	THE CENTRAL WATERFRONT: A STRATEGIC PLACE IN TRANSITION	32
3.4	URBAN INTENSITY	32
3.5	LAND-USE CONCEPT	36
3.5.1	COMPATIBILITY WITH CURRENT PROPOSALS	36
3.5.2	COMPATIBILITY WITH OPEN SPACE CONCEPT	36
3.5.3	RESIDENTIAL AREAS AND LAND-USE/GROWTH SCENARIOS	36
3.5.4	MIXED-USE AREAS	38
3.5.5	PORT/INDUSTRIAL AREAS	38
3.5.6	SUMMARY: A CONTEXT FOR ASSESSING ROAD SYSTEM CONCEPTS	39
3.6	THE IMPACT OF THE GARDINER EXPRESSWAY/LAKE SHORE BOULEVARD ON THE CENTRAL WATERFRONT AS A PLACE	39
3.7	THE OPPORTUNITY	43
4.	THE CENTRAL WATERFRONT AS A CORRIDOR	45
4.1	GOODS MOVEMENTS	46
4.1.1	PAST TRENDS	46
4.1.2	FUTURE TRUCK VOLUMES	48
4.2	PERSON TRAVEL	49
4.2.1	TRAVEL PATTERNS	49
4.2.2	CENTRAL AREA TRAFFIC	49
4.2.3	THE CENTRAL WATERFRONT CORRIDOR	50
4.2.4	ORIGINS AND DESTINATIONS	51
4.2.5	FUTURE PERSON TRAVEL VOLUMES IN THE CENTRAL WATERFRONT	53
4.2.6	PEDESTRIAN AND CYCLE TRAFFIC	54
4.2.7	CONCLUSIONS	55
4.3	THE ROLE OF TRANSIT	55
4.4	THE ROLE AND FUTURE OF ROAD TRANSPORTATION	57
4.5	CORRIDOR MODAL ROLES ARE CHANGING	59
4.5.1	GOODS MOVEMENTS	59
4.5.2	PERSON MOVEMENTS	60
4.5.3	SUMMARY	60
4.6	THE CHALLENGE	62

5. ROAD CONCEPTS FOR THE CENTRAL WATERFRONT	63
5.1 FAMILIES OF ROAD SYSTEM CONCEPTS	64
5.2 CONCEPTS IN WHICH THE ELEVATED EXPRESSWAY IS RETAINED	64
5.3 CONCEPTS IN WHICH THE ELEVATED EXPRESSWAY IS REMOVED	74
5.4 CONCEPTS IN WHICH THE EXPRESSWAY IS BURIED	75
5.5 ANALYSIS AND SCREENING	76
6. ASSESSMENT OF ROAD SYSTEM CONCEPTS	77
6.1 CRITERIA	78
6.2 ASSESSMENT PROCESS	78
6.3 COMPARISONS AND TRADE-OFFS	78
6.3.1 LAND USE/URBAN DESIGN (EXHIBIT 25)	78
6.3.2 ENVIRONMENT (EXHIBIT 26)	80
6.3.3 TRANSPORTATION (EXHIBIT 27)	83
6.3.4 ECONOMICS AND FINANCE (EXHIBIT 28)	83
6.4 SUMMARY: OPPORTUNITIES AND RISKS (EXHIBIT 29)	85
7. CONCLUSIONS	87
7.1 RECAPTURING THE WATERFRONT IS AN ACHIEVABLE GOAL	88
7.2 ECONOMIC PROSPERITY AND ENVIRONMENTAL IMPROVEMENT ARE THE BASES	88
7.2.1 ECONOMIC PROSPERITY	88
7.2.2 ENVIRONMENTAL QUALITY	89
7.3 CENTRAL WATERFRONT HOUSING IS THE CATALYST	90
7.4 EXPANDED TRANSIT IS THE WORKHORSE	91
7.4.1 SIGNIFICANTLY EXPANDED AUTO TRAVEL IS NOT FEASIBLE	91
7.4.2 GO TRANSIT CAN CARRY MOST OR ALL OF THE GROWTH	92
7.4.3 ADDITIONAL GO TRANSIT STATIONS CAN SERVE AND HELP SHAPE THE CENTRAL AREA	93
7.4.4 FEEDER/DISTRIBUTOR TRANSIT IS NECESSARY	93
7.4.5 OTHER CENTRAL AREA TRANSIT IMPROVEMENTS ARE DESIRABLE	94
7.5 CONNECTED ROADS ARE THE SKELETON	94
7.5.1 THE GARDINER/LAKE SHORE FACILITY IS IMPORTANT BUT ITS ROLE IS CHANGING	94
7.5.2 THE BENEFITS OF A LONG TUNNEL WOULD NOT JUSTIFY ITS COST	94
7.5.3 RETAINING THE EXPRESSWAY WITH AMELIORATION COULD REDUCE ITS BARRIER	96
EFFECTS AND IMPROVE THE CENTRAL WATERFRONT AS A PLACE	96

7.5.4	THE BARRIER EFFECT IS MOST PRONOUNCED IN THE CENTRAL SEGMENT	97
7.6	GARDINER/LAKE SHORE CHANGES ARE OPTIONS WHICH CAN FOLLOW	98
7.6.1	RETAINING THE EXPRESSWAY IS A LOW-RISK, RELATIVELY LOW-REWARD OPTION	98
7.6.2	REMOVING PART OF THE EXPRESSWAY WOULD ALLOW A BETTER PLACE TO EMERGE	98
7.6.3	REMOVAL WOULD REQUIRE PREREQUISITE ACTIONS	99
7.6.4	EVOLUTION IS POSSIBLE FROM RETAINING THE EXPRESSWAY AND AMELIORATING ITS EFFECTS TO REMOVING IT	99
7.6.5	THE RETAIN/REMOVE OPTION CAN BE KEPT OPEN	101
7.6.6	ADAPTIVE BUILDING DESIGNS ARE POSSIBLE	104
7.6.7	MORE CONTINUOUS AND CONNECTED ARTERIAL ROADS ARE NECESSARY	105
7.6.8	CREATION OF MORE ROAD CAPACITY CAN BE MANAGED AS AN INTERIM STEP	105
7.7	TRANSPORTATION MANAGEMENT IS THE CHALLENGE	107
7.7.1	EFFECTIVE TRANSPORTATION MANAGEMENT IS PUBLIC POLICY AT ALL GOVERNMENT LEVELS	107
7.7.2	CENTRAL AREA PARKING IS AN IMPORTANT POLICY LEVER	107
7.7.3	TRANSPORTATION MANAGEMENT RESULTS WILL HELP PROVIDE A BASIS FOR DECISIONS REGARDING CHANGES TO THE GARDINER/LAKE SHORE FACILITY	108
8.	SUGGESTED ACTIONS	109
8.1	STAGE 1 PROGRAM	110
8.1.1	GREEN INFRASTRUCTURE	111
8.1.2	CENTRAL WATERFRONT HOUSING AND ECONOMIC DEVELOPMENT	111
8.1.3	GO TRANSIT EXPANSION	111
8.1.4	IMPROVED TTC SERVICES	111
8.1.5	BETTER ROAD CONNECTIONS	112
8.1.6	TIMING TARGETS	112
8.1.7	NO MAJOR NEW EXPENDITURES	113
8.2	STAGE 2 PROGRAM	113
8.3	A WINDOW OF OPPORTUNITY	114
8.3.1	MEETING GOVERNMENT GOALS AND HELPING TO RECOVER FROM THE RECESSION	114
8.3.2	PROVIDING AN IMPROVED FRAMEWORK FOR RENEWED COMMERCIAL ACTIVITY	114
8.3.3	THE VISION	116
	ACKNOWLEDGEMENTS	118

LIST OF EXHIBITS

1.	PRIMARY STUDY AREA	13
2.	REGIONAL CONTEXT	14
3.	GREATER TORONTO BIOREGION	14
4.	THE CENTRAL AREA AND PLANNING, DISTRICT 1	15
5.	ECOSYSTEMS AND OBJECTIVES	19
6.	STUDY STRUCTURE AND WATERSHED PRINCIPLES	20
7.	MAJOR EXISTING INDUSTRIAL AREAS, FREIGHT RAIL AND HIGHWAY FACILITIES	23
8.	GREEN CONNECTIONS	28
9.	EMERGING LAND-USE RELATIONSHIPS	33
10.	URBAN INTENSITIES	34
11.	LAND-USE CONCEPT	35
12.	DEFENSIVE BUILDINGS	40
13.	LEGIBILITY AND CONNECTIONS	41
14.	EXISTING MAJOR TRANSPORTATION FACILITIES	47
15.	TRUCKS ENTERING CENTRAL WATERFRONT ACROSS BATHURST & DON RIVER SCREENLINES	48
16.	1975-1990 TRAFFIC GROWTH AT THE CENTRAL AREA CORDON	49
17.	PAST/FUTURE CENTRAL AREA TRAVEL	50
18.	ROAD VEHICLES ENTERING CENTRAL WATERFRONT ACROSS BATHURST & DON RIVER SCREENLINES	51
19.	PERSONS ENTERING CENTRAL WATERFRONT ACROSS BATHURST & DON RIVER SCREENLINES	52
20.	1986 A.M. PEAK TWO HOURS AUTO TRIP DISTRIBUTION FOR CENTRAL GARDINER EXPRESSWAY	52
21.	POSSIBLE TRANSIT CONCEPTS	66
22.	ILLUSTRATIVE ROAD SYSTEM CONCEPT 1b	68
23.	ILLUSTRATIVE ROAD SYSTEM CONCEPT 2c	70
24.	ILLUSTRATIVE ROAD SYSTEM CONCEPT 3b	72
25.	TRADE-OFFS FOR CRITERION 1: LAND USE/URBAN DESIGN	79
26.	TRADE-OFFS FOR CRITERION 2: ENVIRONMENT	81
27.	TRADE-OFFS FOR CRITERION 3: TRANSPORTATION	82
28.	TRADE-OFFS FOR CRITERION 4: ECONOMICS/FINANCE	84
29.	MAJOR ASSESSMENT TRADE-OFFS	86
30.	ECONOMIC AND ENVIRONMENTAL IMPACT OF HOUSING PROGRAM	91
31.	ILLUSTRATIVE ROAD SYSTEM CONCEPT 2x	102
32.	LAND-USE AND TRANSPORTATION CONCEPT	115

Chapter One

INTRODUCTION



1.1 BACKGROUND

The *Toronto Central Waterfront Transportation Corridor Study* is one of two major reports dealing with the Central Waterfront undertaken in 1991 by the Royal Commission on the Future of the Toronto Waterfront. The other is the *Preliminary Master Plan for Garrison Common*.

Both projects were carried out at the request of the Government of Ontario, as announced in the Legislature on 17 December 1990 by the Honourable Ruth Grier, Minister of the Environment and minister responsible for the Greater Toronto Area (GTA). The request was made after the governments of the City of Toronto, Metropolitan Toronto, the Province of Ontario, and Canada endorsed *Watershed*, the Royal Commission's 1990 interim report.

Planning for Garrison Common and the Central Waterfront transportation corridor must be integrated and coordinated with the various governments' ongoing implementation of the Royal Commission's recommendations for the East Bayfront/Port Industrial Area.

Recognizing this, and appreciating that all levels of government have jurisdictional and proprietary interests at stake, the Royal Commission created a Steering Committee consisting of senior officials from each level of government to provide direction and guidance for the Garrison Common and Central Waterfront projects, and to co-ordinate and integrate them with actions in the East Bayfront/Port Industrial Area and other parts of the Central Waterfront.



1.2 THE TRANSPORTATION CORRIDOR STUDY

The Royal Commission retained a consulting team to carry out the initial phase of the work, which will contribute to a plan for the Central Waterfront, to be incorporated in the Royal Commission's final report. The consulting team included members of 11 consulting firms, representing a diverse range of professional disciplines and specialized interests, including environmental planning, urban design, land-use planning, transportation planning, and engineering, economics, and finance.

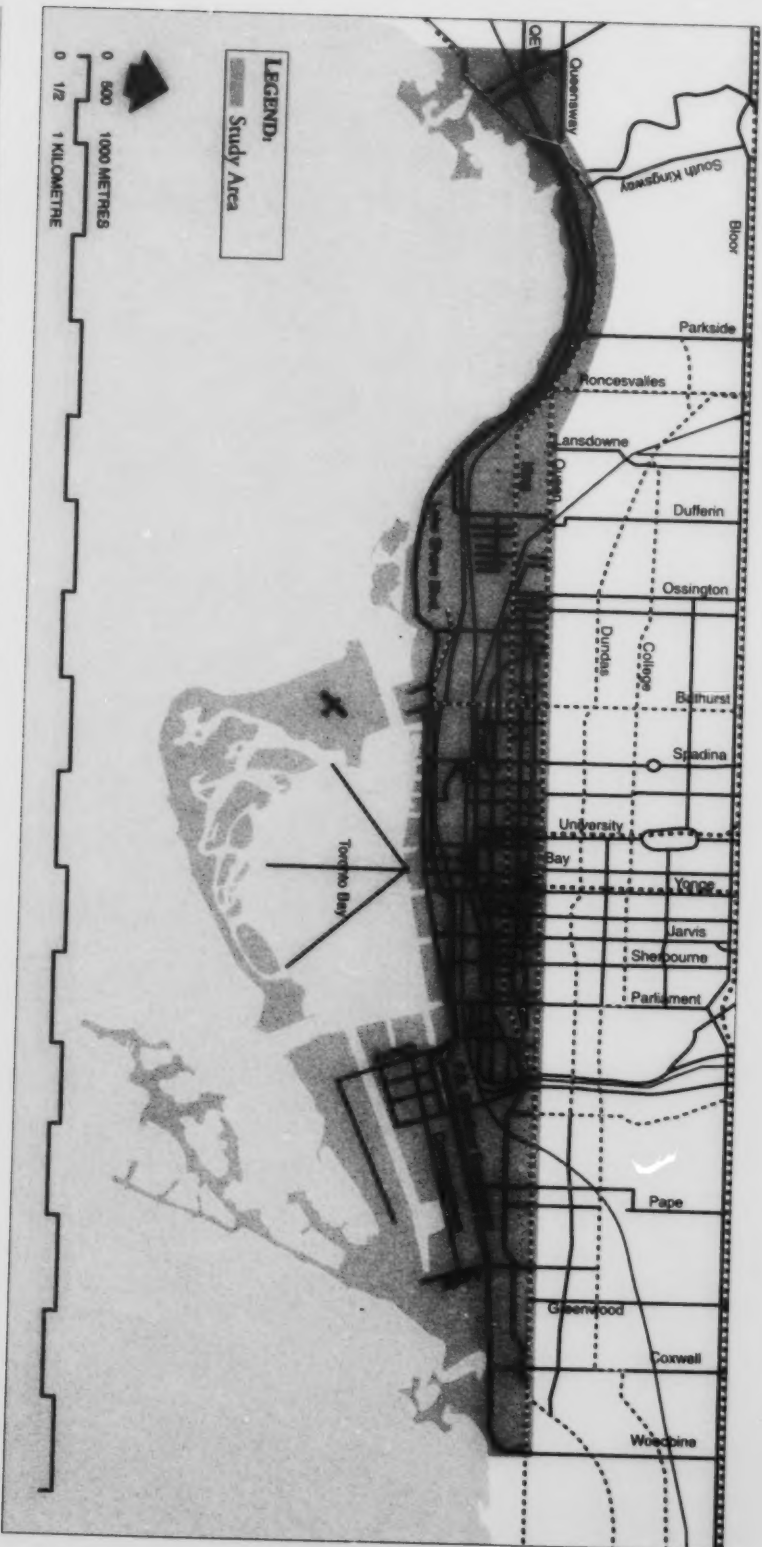
This study analyses regional transportation interactions and develops and assesses various concepts for the Central Waterfront. Particular emphasis is placed on alternative ways of dealing with the elevated section of the Gardiner Expressway. The study also includes an assessment of how the waterfront transportation system functions and performs, and the implications of various transportation concepts for the area's

environmental quality, green spaces and links, land use, urban design and livability, transportation, and economic prosperity.

The study commenced in mid-April and was completed in October 1991 — very little time for such a complex matter, especially given the collaborative approach involving senior officials from all levels of government.

This study report summarizes the results of the study, with particular reference to attributes of the Central Waterfront as a **place** and as a **corridor**, alternative future concepts and an assessment of their consequences, study conclusions based on this assessment, and suggested actions. A companion technical report of some 450 pages is also available on a more limited basis, for those interested in additional detail regarding the study approach, methodology, and results.

EXHIBIT 1 PRIMARY STUDY AREA



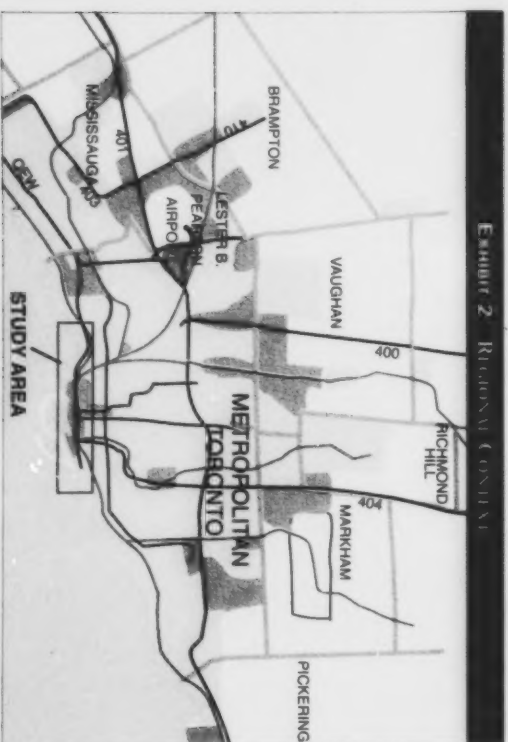
1.3 STUDY AREA

The primary area studied is defined as the Central Waterfront, bounded on the north by Queen Street and the Queensway, on the south by the Lake Ontario shoreline, on the west by Park Lawn Road, and on the east by Woodbine Avenue. (See Exhibit 1.)

EXHIBIT 2 LEGEND	
—	Rapid Transit
—	Commuter Rail
—	Major Highways
■	Residential Area
■	Employment Area

EXHIBIT 3 LEGEND	
■	Oak Ridges Moraine
■	Niagara Escarpment

The entire waterfront area between Metropolitan Toronto's east and west boundaries was considered in terms of waterfront planning issues related to transportation and ancillary functions of the Central Waterfront and the broader Greater Toronto Area. Exhibit 2 shows the strategic location of the Central Waterfront in the GTA. Transportation demand and supply relationships in the Greater Toronto Bioregion (the GTB as defined in *Watershed* and illustrated in Exhibit 3) were considered, as well as related land-use, environmental, and economic interactions between the GTB and the Central Waterfront, in accordance with the ecosystem approach. (This approach is discussed further in Section 3.3.) Reference is also made to the Central Area of Toronto (defined as running east from Bathurst Street to the Don River, and north from Lake Ontario to the CP Rail tracks north of Dupont Street) and to Planning District 1. Both are illustrated in Exhibit 4.



1.4 CENTRAL WATERFRONT PLAN

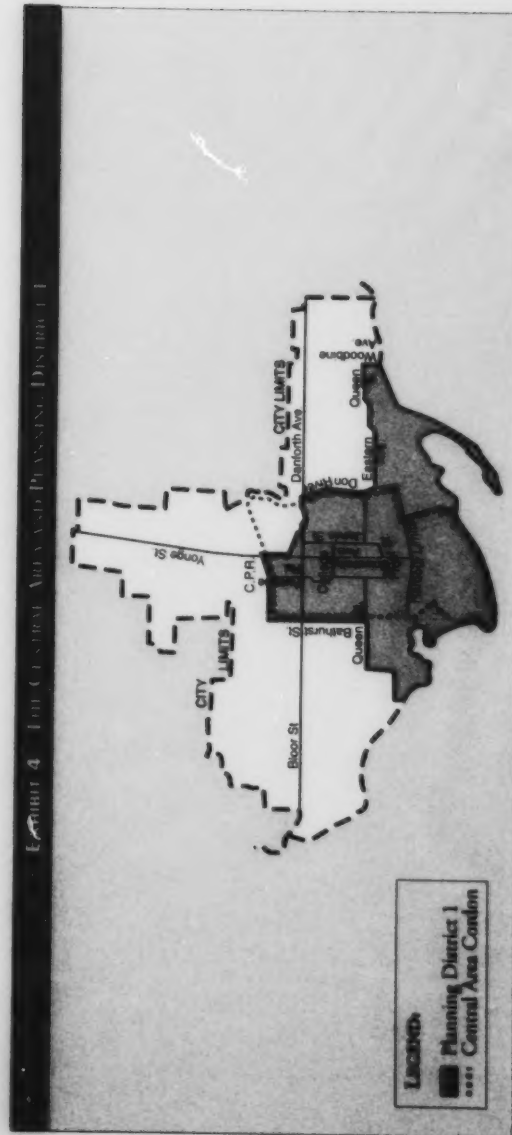
The Central Waterfront Plan, now being prepared by the Royal Commission, will integrate environmental/transportation/land-use/parks and open space/urban design, and economic considerations. The underlying purpose is to promote a healthy and accessible waterfront and central city within a healthy and economically competitive region.

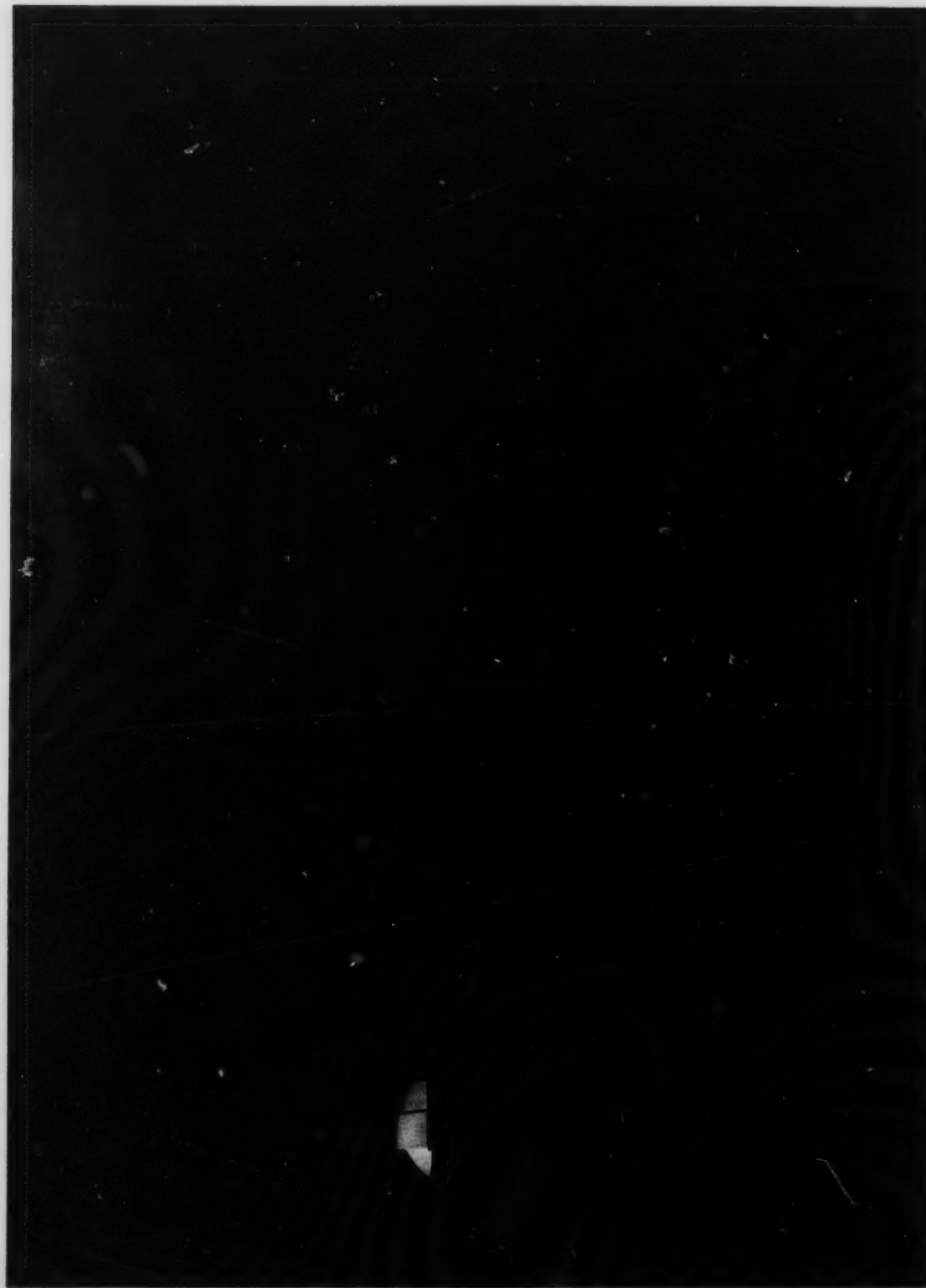
1.4.1 Strategic Objectives

The strategic objectives for the plan are to:

1. improve the Central Waterfront, recognizing its strategic importance as a **place** as well as a **corridor** in the context of the GTB;
2. improve the relationship and links between the GTB, the central city, and the waterfront; and
3. within the context of the first two objectives, improve the overall transportation system to and through the Central Waterfront.

The Transportation Corridor Study, which is summarized in this report, provides important input to the overall Central Waterfront Plan, as do other studies being carried out by and for the Royal Commission.





Chapter Two

TRANSPORTATION CORRIDOR STUDY



2.1 APPROACH

The Transportation Corridor Study has three basic elements:

- to **identify** and describe alternative transportation concepts for replacing the elevated Gardiner Expressway or ameliorating its effects, and related changes to other transportation modes, while addressing other objectives of the plan;
- to **screen** the identified transportation alternatives, not only in terms of transportation service and cost, but, equally, in the context of plan objectives and the ecosystem approach;
- to **assess** the more promising transportation/land-use concepts in terms of transportation, environmental, land-use, parks/open space, urban design, economic, staging, and cost criteria.

This preliminary study has been designed to identify the range of issues that should be addressed and resolved in the subsequent phases of public input, detailed technical studies, policy decisions, and implementation. A wide variety of major planning reports and information sources were reviewed and, as appropriate, summarized as a basis for the study. For example, a January 1990 report by the Commissioner of Transportation of Metropolitan Toronto examined different ways of dealing with the Gardiner Expressway.

2.2 GENERIC ALTERNATIVES

To analyse the consequences of different treatments of the elevated sections of the Gardiner Expressway, four generic alternatives were considered:

1. **retain** the elevated Expressway and ameliorate its urban impact;
2. **remove** the elevated Expressway and replace some of its capacity with other roads and improved transit service;
3. **bury** the elevated Expressway, forming a new expressway below grade; and/or
4. **replace** the elevated Expressway with a new expressway at-grade.

Initial study by the team indicated that a new expressway at-grade was not a viable alternative because of problems of physical feasibility and urban impact. Accordingly, the work focused on the first three alternatives — **retain**, **remove**, and/or **bury** the Expressway — recognizing that combinations of the three approaches are possible, reflecting different conditions in various parts of the Central Waterfront.

2.3 USING THE ECOSYSTEM APPROACH

The need to apply an ecosystem approach to the Toronto waterfront was recognized early in the work of the Royal Commission. The basic principles of this approach were identified in *Watershed* and subsequently elaborated in the report on the environmental audit of the East Bayfront and Port Industrial Area, *Pathways: Towards an Ecosystem Approach*. The healthy community model shown in Exhibit 5 is taken from that report. It summarizes the basic relationships among the **community**, its **environment**, and the **economy** needed to achieve a healthy community. This framework illustrates the global objectives of the ecosystem approach.

The use of this method in the transportation corridor study extends the perspective of current planning methodologies, including the traditional approach to urban transportation planning. Specifically, the ecosystem approach provides a broad context for conceiving and evaluating alternative courses of action in terms of their consequences to the **environment**, the **community**, and its **economy**, recognizing the **interactions** among the three. A major objective of the ecosystem approach is to achieve a better understanding than previously available of these interactions and their cumulative impact on society, so that it can achieve a better and more sustainable balance among the three basic aspects on which it depends for continuing survival and well-being.

2.4 PRINCIPLES

As stated in *Watershed*:

"...it is the view of the Royal Commission that the waterfront should be:

- clean;
- green;
- useable;
- diverse;
- open;
- accessible;
- connected;
- affordable;
- attractive."

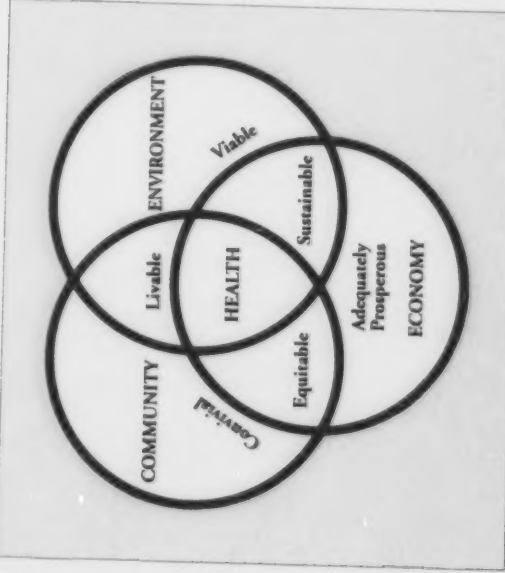


EXHIBIT 5
ECOSYSTEMS AND OBJECTIVES

"Simply put, an ecosystem consists of air, land, water, and living organisms, including humans, and the interactions among them."

-Pathways

Source: Dr. Trevor Hancock

Relationships among the nine principles and the three basic aspects of the urban ecosystem are illustrated in Exhibit 6. As indicated, the community component is divided into two categories for the purpose of this study: **connectors** (i.e., the basic infrastructure that serves the community, including transportation, green links between larger green areas, communications, municipal services and utilities); and **places** (i.e., homes, workplaces, parks and open spaces, community facilities, commercial and entertainment establishments).

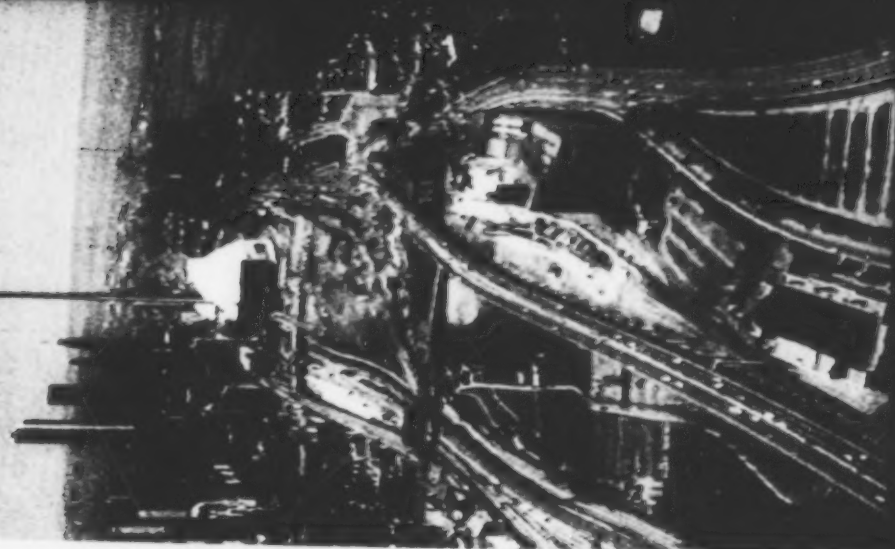
There are many examples of mutual dependencies among connectors/places, the environment, and the economy. For instance, the development of compact housing in the Central Waterfront and the Central Area, along with continuing employment growth, serves economic and community functions while also improving the proximity of homes and workplaces and moderating the increase of long, often auto-dependent commuting trips to downtown. Parallel implementation of a comprehensive environmental plan — including open space, parks and green links, improved quality of air, water, soil, habitats, and microclimate, reduced noise, etc. — is essential as a basis for introducing and attracting residential, employment, and recreational uses in the area and maintaining its quality and health for such uses.

At the same time, unless there is an integrated planning framework and long-term strategy, the new residential and mixed-use neighbourhoods may constrain the useability and improvement of critical connectors, thereby affecting the environment and the urban economy.

EXHIBIT 6
STUDY STRUCTURE AND
WATERSHED PRINCIPLES

COMMUNITY		
	CONNECTORS	PLACES
ENVIRONMENT	CLEAN GREEN ACCESSIBLE CONNECTED ATTRACTIVE	CLEAN GREEN USEABLE DIVERSE OPEN CONNECTED ATTRACTIVE
ECONOMY	USEABLE ACCESSIBLE AFFORDABLE	USEABLE DIVERSE ACCESSIBLE AFFORDABLE

THE CENTRAL WATERFRONT AS A PLACE



3: THE CENTRAL WATERFRONT AS A PLACE

In this study the concept of **place** is addressed in terms of:

- **economic factors:** e.g., land prices, economic opportunities and trends, competitive efficiency, and resulting prosperity levels;
- **environmental factors:** e.g., the quality of terrestrial and aquatic habitats including land/water interfaces; microclimate; the quality of air, water, and soils; levels of noise, dust and vibration; and a continuous open space network; and
- **land-use and urban design factors:** e.g.,

LIVABILITY as achieved by safe, secure, pedestrian-friendly streets, sidewalks, and public spaces, tree-lined streets and walkways, continuity of street-front activity and uses, and a system of parks and green links;

WORKABILITY in terms of convenience of access and mix of uses; and

ORIENTATION as affected by the quality of civic arrival (views of the city and its natural setting by those arriving in transit vehicles and autos, and by other travel modes) and the legibility (a sense of location and direction) of the road and transit network and the pattern of city blocks.

In short, the term **place**, as used here, is shorthand for an area that is habitable, memorable, comfortable, and pleasant, is economically viable, and meets the nine *Watershed* principles, particularly at an individual scale, but also at the broader scale of urban blocks, squares, parks, and broad vistas. These attributes, and emerging opportunities to achieve a better **place** in the Central Waterfront, are discussed below, dealing in turn with the **economy**, the **environment**, and the **community**.

3.1 ECONOMIC TRENDS AND CHANGING LAND USES

Toronto's Central Waterfront has been experiencing economic changes similar to those in other major metropolitan areas. At the end of World War II, Canada was the world's fourth largest manufacturing country. Manufacturing has continued to play a fundamentally important role in Canada's economy during the past four and a half decades, but its relative importance has declined and its nature has changed as the capabilities of other nations have developed and our own service economy has grown. Toronto's Central Area and nearby areas in South Etobicoke, Scarborough, and to the north in what is now Metropolitan Toronto contained perhaps the single largest concentration of Canada's manufacturing capability during the War and for one or two decades following it. This important function was supported by the massive road-building program of the 1950s and 1960s which included, among other important links, the Gardiner Expressway, the Don Valley Parkway, and Highway 401.

3.1.1 Migration of Heavy Industry and Rail Activities

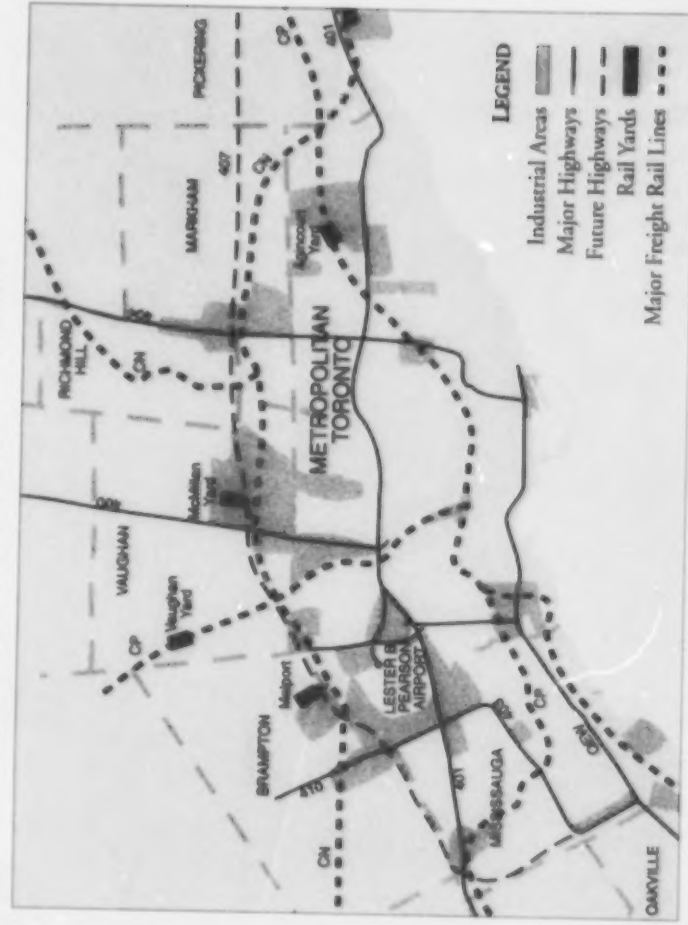
As the metropolitan region grew, however, land values in the Central Area increased dramatically and so did the intensification of land uses in the Central Area and Central Waterfront. Faced with these trends and resulting increases in road traffic and congestion, heavy industries started as early as the 1960s to migrate from their original, central locations to suburban sites where land values were lower, modern one- or two-storey facilities could be constructed economically, and adjacent freeways provided greatly improved access for the increasingly important truck mode.

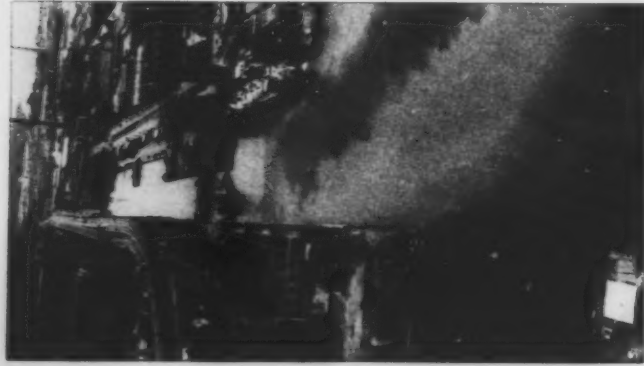
It is no accident that C.N. Rail decided to build a bypass freight rail line (the York and Halton subdivisions just north of the Metropolitan Toronto boundary) 30 years ago, and to construct major new freight yards adjacent to that line, transferring rail freight operations from the Central Area to suburban areas. Similarly, CP Rail created a major new freight classification yard at Agincourt and moved its freight operations from the centre, while continuing to use its Galt, North Toronto, and Belleville subdivisions (which pass through midtown Metropolitan Toronto) as its main line for freight traffic. The railways were responding to the centrifugal migration of their major industrial customers and to similar economic forces: it was more efficient in operational and economic terms to build the extensive new classification yards on suburban land, which was also well served by highways for truck interchange movement, and to free up more valuable downtown land for other, more intensive, urban uses.

The railway's move also freed up significant capacity on the "spider's web" of radial rail lines converging on Union Station, (see Exhibit 2) allowing the introduction of commuter rail service by the Province of Ontario, initially on the Lakeshore West and Lakeshore East lines, in 1967.

Exhibit 7 illustrates this migration by showing where the major industrial areas and related railway facilities are now located in parts of the GTA, as the result of the relocation decisions. As indicated, the major concentrations of heavy

EXHIBIT 7
MAJOR EXISTING INDUSTRIAL AREAS,
FREIGHT RAIL AND HIGHWAY
FACILITIES





industry, as well as other industrial activities, are now in the outer reaches of Metropolitan Toronto (e.g., towards Pearson International Airport and in northeast Scarborough) and beyond (in Oakville, north Mississauga, Brampton/Bramalea, Vaughan, Markham, Pickering, Ajax, Oshawa, etc.). While some of these municipalities already had substantial industrial activity during and following the War, they have all benefited economically from the exodus of industry from central Toronto.

3.1.2 Specialization of Central Land Uses

Accompanying these changes, a trend developed for more intense and specialized use of land in the Central Waterfront, utilizing the hundreds of hectares of prime land vacated by industrial and rail activities. Expansion of the financial service industry, and its physical manifestation in the office buildings of major international and national financial institutions in Toronto's central core, are obvious examples. Office, retail, and trade activities have also expanded and intensified greatly in the Central Area, as well as in other city centres (e.g., North York, Scarborough, Mississauga) in accordance with the Metropolitan Toronto Official Plan, official plans of adjacent municipalities, and provincial policies.

Total office/commercial growth in the regional centres and throughout the GTA has rivalled that in the Central Area in absolute terms but the Central Area remains an order of magnitude greater in size, diversity, and critical importance than any of the other centres. While continuing growth is anticipated in all of these centres, it is expected that the Central Area will remain paramount within the GTA and will continue as a major financial centre in the global markets of the next century. In addition, the Central Waterfront has become the focal point for Toronto's important international tourism, trade, and convention industries and associated recreational areas and facilities.

3.1.3 Urban Industrial Uses

While heavy manufacturing and related warehousing have tended to move to the suburbs, there has been significant growth in a wide variety of light industrial activities, sometimes referred to as **urban industrial**, which are thriving in the shoulder areas adjacent to the financial core. These activities, many of which are directly related to office/commercial activities but are not able to pay the same premium rents, include the burgeoning information industry (computer systems, data processing centres, word processing, software development, communications) and media industries (e.g., publishing, films, music, visual art forms) that have expanded in their own right and in support of other commercial activities.

Urban industrial activities tend to be "at home" in medium-rise (four- to eight-storey) buildings located on urban streets, and have naturally congregated in the stock of such buildings, which exists in the shoulder areas surrounding the financial core. Accordingly, these areas have experienced a significant transformation in terms of both occupying uses and physical rehabilitation, particularly during the past one or two decades.

3.1.4 Suburban Residential Growth

During the 1960s and early 1970s, the remaining "greenfields" land in Metropolitan Toronto was largely used up, and there has been dramatic population growth in the adjacent regional municipalities (Peel, Durham, York, and Halton) during the past two decades. As documented in the 1990 *Greater Toronto Area Urban Structure Concepts Study*, earlier suburban residential development in Metropolitan Toronto was relatively compact and occurred within the context of a well-developed urban transit system.

In contrast, subsequent development in the adjacent regions has, until recently, tended to be at lower densities, without the benefit of extensive urban transit services, and has created extensive auto-dependent areas surrounding Metropolitan Toronto. These growth trends have added greatly to the pressure for cross-boundary commuting trips to jobs within Metropolitan Toronto. A large majority of these trips have been and are made by automobile, reflecting the lack of convenient transit in many of the spread, low-density residential areas from which they originate.

3.1.5 Downtown Residential Growth

During the 1980s, a long-term trend towards reduced residential population in the Central Area was reversed and there was a slight increase (about 12,000 people) in downtown Toronto's resident population between 1981 and 1989. The City of Toronto has studied and documented the importance of an increased Central Area population to help moderate the growth pressure for long commuting trips from the suburbs. Also, the *Greater Toronto Area Urban Structure Concepts Study* has documented the substantial economic and environmental benefits of more compact residential redevelopment in Central Areas and other nodal communities, compared to creating new, lower-density subdivisions on farmland.

It is now a central element of land-use policies proposed by the City of Toronto and Metropolitan Toronto, and encouraged by the Province of Ontario, that there should be a significant increase in Central Area resident population and a more compact and intimate mix of residential, employment, and other uses throughout the GTA. These policies

will serve the interests of those living in both suburban and central locations and of future residents and workers in all parts of the metropolitan area and beyond.

Opportunities to take advantage of these changes and increasing trends towards land-use intensification and specialization are being opened up by the exodus of manufacturing industry, warehousing, and related freight transportation activities from the Central Waterfront.

3.2 A UNIQUE ENVIRONMENTAL OPPORTUNITY

The ongoing transition of the Central Waterfront from largely industrial and related transportation uses to a more diverse and urbane **place** — and the fact that hundreds of hectares are currently vacant or underutilized and waiting for the second half of the transformation to occur — provides this generation of Torontonians with a unique opportunity to improve the area's natural and physical environment. This is discussed below, first in terms of creating a "green infrastructure" of open spaces, parks, and links, and then in terms of other aspects of environmental quality.

3.2.1 Green Infrastructure

HABITAT QUALITY

Generally speaking, urbanization processes in the Central Waterfront have degraded both terrestrial and aquatic habitats. Among the last remaining major natural water/land systems are the Toronto Islands, the Humber River, and the Leslie Street Spit, which still offer fish and waterfowl habitat opportunities. Potential migration from these areas could improve species composition in rehabilitated sites, in particular the lower Don River, the Humber Bay breakwaters, and the Ontario Place lagoons. The latter areas offer great potential for fish habitat because they are protected from cold lake water, creating a more benign thermal environment.

The City of Toronto has several major north-south natural systems, largely based on rivers and ravines, which have significant wildlife potential. Currently, the major natural open spaces — the Humber River Valley, High Park, the Toronto Islands, the Leslie Street Spit, and the Don River Valley — are very fragmented, with poor connections to each other and to the waterfront.

As noted in the recent Garrison Common report, the large amounts of parking at Exhibition Place and along the water's edge at Ontario Place have resulted in a poor environment for wildlife and for human activity. Large areas devoid of any vegetation create an inhospitable environment and a barrier for wildlife. Several proposals are emerging

from the Royal Commission's work to improve wildlife habitat, to increase diversity in vegetation communities along the waterfront, and to improve the connectivity of the natural open space systems.

OPEN SPACE

Perhaps the single most important message in the Royal Commission's *Watershed* report as it pertains to the Central Waterfront is the need to establish, protect, and enhance green open spaces — both manicured for relatively intensive recreational use and in a more natural state for less intensive use — and continuous green links joining such spaces, along with related steps to improve environmental quality. The conceptual understanding of desirable and achievable green areas and links in the Central Waterfront that is emerging from the work of the Royal Commission and its consultants, in co-operation with other interested jurisdictions and agencies, is illustrated in Exhibit 8.

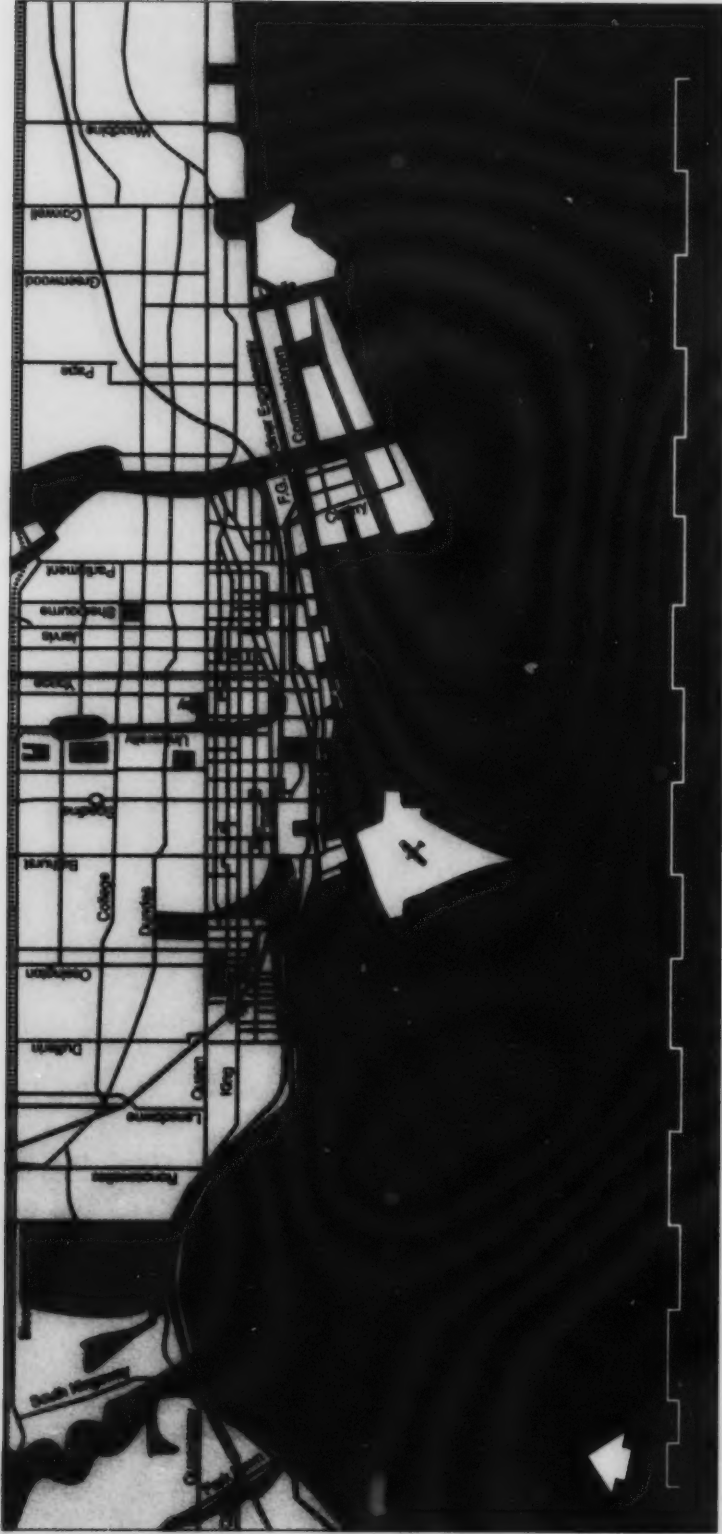
GREEN LINKS

Some of the proposed green areas and links are regional in character, including major north-south connections along the Lower Humber River and the Lower Don River, with re-establishment of a wetland environment at the mouth of the Don, possibly in association with a southward reorientation of the river as it emerges into Lake Ontario. Other proposed north-south links include a continuous extension of park areas northward from Coronation Park and a major new park in the southeast part of Exhibition Place, via Fort York, extending north to the Trinity/Bellwoods park area and adjacent residential neighbourhoods.

Three important north-south green links are proposed that will connect urban parks in the Central Area to the waterfront: in the Bathurst/Spadina area, in the Roundhouse Park area west of Simcoe Street, and in the St. Lawrence housing area, linking Crombie Park through the East Bayfront to the bay.



GREEN CONNECTIONS



A continuous east-west waterfront pedestrian and bicycle trail, the Greenway, is also shown in Exhibit 8. This trail, which has been one of the major recommendations of the Royal Commission, will ultimately tie the Bruce Trail along the Niagara Escarpment to the Ganaraska Trail east of Toronto, as well as to north-south trails through the major river valleys in the Greater Toronto Bioregion.

OPEN SPACE AND LINKS AS GREEN INFRASTRUCTURE

This emerging open space concept provides a setting for important requirements: the waterfront trail and improved access by pedestrians/bicyclists to the waterfront; heritage features; opportunities for improved terrestrial and aquatic habitats, as well as human recreational activities; and opportunities to improve the diversity and mix of places, as well as microclimatic conditions. The main thrust of the concept is to improve, expand, and protect open spaces, green links, and land/water interfaces with emphasis both on human amenities and recreational opportunities and on terrestrial and aquatic habitats for other species. The emerging open space/green links concept also provides the basic green infrastructure for urban development.

3.2.2 Environmental Quality

AIR QUALITY

According to a report by the Medical Officer of Health of the City of Toronto in May 1988, the ambient air quality in the City of Toronto is generally satisfactory, and measurements indicate that reductions have been achieved in all source sectors except vehicle emissions. These were noted as having increased since 1978. About 85 per cent of carbon monoxide (CO) emissions and 55 per cent of nitrogen oxides (NOx) in the Metropolitan Toronto area are produced by motor vehicles. These pollutants have serious effects on human health and on the environment. In addition, motor vehicles produce substantial carbon dioxide (CO₂) emissions, one of the major greenhouse gases. CFC-based (chlorofluorocarbon) coolant leakage from motor vehicles and building air conditioning systems has been cited as a major contributory factor to the depletion of stratospheric ozone and resulting increased risks to human health and agriculture.

Recently, the Healthy City Office of the City of Toronto published a report containing recommendations for reducing vehicle emissions and automobile use by applying a wide variety of transportation management measures. The report was developed following the 1988 Changing Atmosphere Conference on Global Warming and the

subsequent decision by the Council of the City of Toronto to reduce carbon monoxide emissions by 20 per cent by the year 2005.

Adoption of more stringent emission standards by the United States under the 1990 Clean Air Act Amendments includes significant reductions in automotive emission levels and a requirement for phasing out CFC use in the USA by the year 2000. New standards adopted by the California Air Resources Board will require a 50 per cent reduction in carbon monoxide emissions in new cars by 1993 and a reduction of hydrocarbons by 40 per cent and nitrogen oxides by 50 per cent for 20 per cent of cars sold in 1997, rising, by the year 2000, to 100 per cent of cars sold. However, corresponding reductions in **total** emissions of various types from automotive traffic will require not only such continuing technological improvements, but also stabilization or reduction of vehicle-kilometres of travel by automobile; this will mean diverting discretionary auto trips to less polluting modes such as public transit, bicycling, and walking.

The experience of the 1970s and 1980s has shown that technological fixes by themselves are not enough: behavioural changes are also required.

WATER QUALITY

As noted in *Watershed*, the problems of water quality in the Greater Toronto Bioregion include river water polluted with nutrients, bacteria, organic chemicals, and heavy metals; beaches closed to swimming; wildlife habitat degraded or lost to development; contaminated bottom sediments; and persistent toxic chemicals in aquatic biota. Major sources affecting the Central Waterfront include storm sewer outlets, combined sewer overflows, and discharges from the Humber and Don rivers. Storm drainage from the transportation facilities in the Central Waterfront Area, including the railway corridor, the Gardiner Expressway, the street systems, and parking lots, is routed via either storm outfalls, which lead directly to the lake, or combined sewers that flow to the sewage treatment plants. In the latter case, storm drainage and significant volumes of sanitary sewage bypass the treatment facilities during major storm events.

SOIL QUALITY

Many parts of the study area have contaminated soil, a result of earlier transportation and industrial uses. Some progress has been made in the past five years in cleaning up properties including the Railway Lands, and programs are being planned for other redevelopment areas such as Ataritari and the Toronto Refiners and Smelter site. Major investments will be required to clean up contaminated areas, and the magnitude of these investments will affect land



values and the type and intensity of future land uses. In turn, the economic impetus from redevelopment will be required to help finance the achievement of acceptable levels of soil quality.

OTHER ENVIRONMENTAL FACTORS

Several additional measures of environmental quality were also considered, including noise and vibration, microclimate, and hazardous materials. While there has been no recent study of noise and vibration in the primary study area, the Royal Commission's Publication No. 11, *Pathways*, noted that primary noise sources in the Central Waterfront are vehicular traffic, particularly from the Gardiner/Lake Shore Corridor; railway traffic; industrial and port activities; and aircraft. The *Cityplan '91* Report 9, *Environmental Background, Part 1*, suggests a number of actions to mitigate noise and vibration from these and other sources.

Microclimate in the Central Waterfront is strongly influenced by the urban design adopted and the resulting built form, as well as by the planting of trees and landscape/design of parks and green links. Important factors include establishing an appropriate mix of shaded and sunny areas for summer use, and sheltered, sunny areas for use in the colder seasons, particularly to provide shelter from wind. There are excellent opportunities to improve microclimatic conditions for increased all-season use of the Central Waterfront, building on recent positive suggestions on this issue.

Most of the hazardous materials transported into and through Metropolitan Toronto move by road and rail, following routes outside the primary study area, although hazardous materials continue to move through the Central Waterfront, particularly in trucks on the Gardiner/Lake Shore facility and trains using the double-track freight link known as the high line. While the probability of individual incidents is small, there is a continuing risk that road or rail accidents will release hazardous materials in solid, liquid, and/or gaseous form. The latter, in particular, would pose a direct risk to people in the area — particularly when fire, explosion, noxious chemicals or radioactivity were involved — and subsequent environmental clean-up would also be required. Ongoing work by all four levels of government is aimed at achieving a better understanding of the extent and nature of these movements and improved ways of reducing the risk of accidents and hazardous materials release, particularly in heavily populated urban areas.

Improved environmental quality, involving all the factors discussed above, will become increasingly important as the residential population of the Central Waterfront increases in future years, along with ongoing increases in the number of people working in and visiting the area.



3.3 THE CENTRAL WATERFRONT: A STRATEGIC PLACE IN TRANSITION

Another important objective for the Central Waterfront, as established in the *Watershed* report, is to re-establish connections between the city and the lake — not only in terms of green links but also in terms of urban uses. This means extending some existing urban uses/neighbourhoods southwards, even as new uses are being developed in the Central Waterfront and adjacent areas. A number of the existing and emerging urban land-use relationships are illustrated in Exhibit 9.

As noted in the *Preliminary Master Plan for Garrison Common* (the Royal Commission's Publication No. 14), the industrial area north of Exhibition Place is undergoing a transformation to more urban industrial uses such as graphics, films, information services, computers, and related quasi-industrial activities. These could expand in relation to the proposed international trade centre at Exhibition Place and mixed-use residential and employment developments around the proposed Garrison Common GO station. Adjacent residential areas, and mixed-use areas in the Bathurst/Fleet Street area, would interact with these activities, contributing to the diversity and economic vitality of the area.

Between Bathurst and Yonge streets, mixed-use development would allow some extension of the financial/commercial core uses southward, in conjunction with activities related to increased housing and residential uses, including retail, commercial, and recreational operations. Similar connections will apply east of Yonge Street, including interactions between the existing St. Lawrence housing neighbourhood and new residential areas south of the railway track, as well as the Atariri development, combined with mixed uses farther south in the East Bayfront area.

Mixed uses on the eastern edge of Toronto Bay would complement mixed-use and residential areas in the East Bayfront, as well as continuing port and industrial activities to the south and east. The proposed Don River wetlands and wildlife corridor would form a buffer between the mixed-use area to the west and the more industrial activities to the east, while providing a green link from the Don River Valley to the lake.

3.4 URBAN INTENSITY

The changing interactions and types of land use, as well as land prices and related economic considerations, lead to a logical hierarchy of urban intensity in and adjacent to the Central Waterfront, as illustrated conceptually in Exhibit 10.

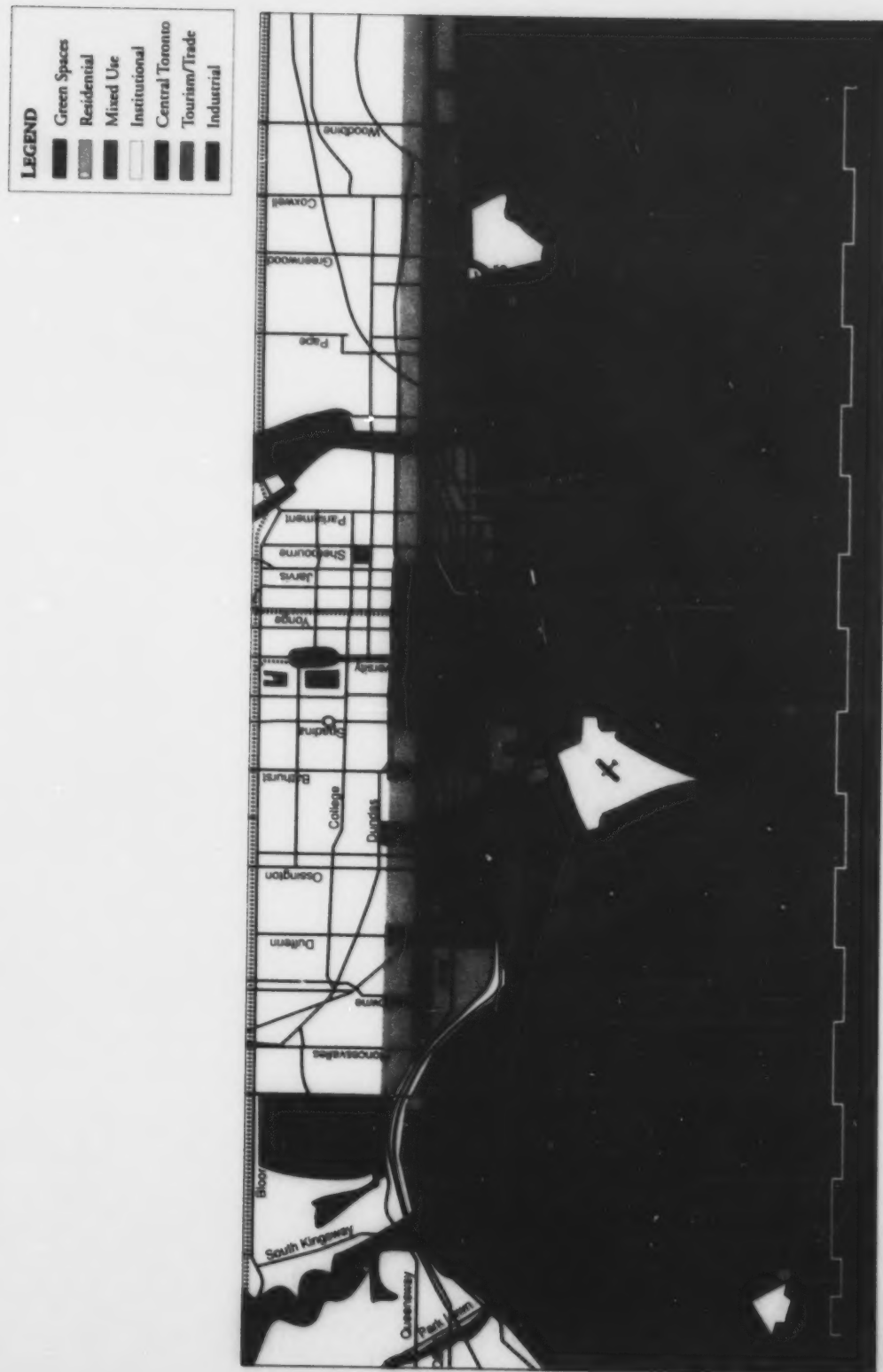
The Central Area between Spadina and Jarvis would tend to have the highest densities, reflecting its proximity to the financial core. This makes it even more important to include green links and people-oriented, tree-lined "green streets" that provide visual and physical links between the existing City and the lake and local relief from the more compact development anticipated in that area.

EXHIBIT 9
EMERGING LAND-USE RELATIONSHIPS



PAGE 34 *THE CENTRAL WATER FRONT AS A PLACE*

EXHIBIT 11
LAND-USE CONCEPT



Relatively high intensities would also be logical in the areas centred on the two proposed "shoulder" GO Transit stations, at Garrison Common (Strachan Avenue) in the west and Ataratiri (Cherry Street) in the east, although densities would be less in these areas than in the centre. In other parts of the Central Waterfront, densities would be considerably lower and the emphasis in all parts would be on built form that opens up vistas and connections to the waterfront as well as to the green open spaces and links described above.

3.5 LAND-USE CONCEPT

Drawing on these precepts and proposals, Exhibit 11 illustrates, in broad terms, an emerging land-use concept as a possible basis for future planning and development in the Central Waterfront. Seven categories of land use are shown: green spaces (green); residential (dark yellow); mixed employment/residential (olive); institutional (light yellow); Central Toronto (red); tourism/trade (light green); and industrial/port (purple).

3.5.1 Compatibility with Current Proposals

The land-use concept is compatible with the recent Royal Commission study on the Garrison Common area (east from Jameson Avenue to Bathurst Street), and with proposals for the Railway Lands (between Bathurst and Yonge streets), for the East Central and East Bayfront areas (between Yonge Street and the Don River), and for the lower Don and Port/Industrial areas (in accordance with concepts developed for the Royal Commission).

3.5.2 Compatibility with Open Space Concept

The land-use concept is also compatible with the recreational/open space opportunities shown in Exhibit 8. In particular, it includes the waterfront trail, major north-south green connectors in the Garrison Common and Lower Don areas, and smaller but significant north-south connectors between the waterfront and the Bathurst/Spadina neighbourhood, the Roundhouse Park west of Simcoe Street, and the St. Lawrence neighbourhood east of Jarvis Street.

3.5.3 Residential Areas and Land-Use/Growth Scenarios

The concept shows extensive areas of medium-density residential uses, a reflection of the strong desirability of achieving substantially increased housing and resident population in the Central Area, thereby reducing the growth in

demand for long-distance commuting to that area, encouraging transit use, increasing the economic efficiency of housing delivery, and greatly increasing the area's diversity and livability. It should also be borne in mind that medium- and higher-density residential uses would also be a part of the mixed-use area.

To consider the implications of the relationships between place of work and place of residence, including various degrees of compactness, five land-use scenarios were developed, representing a range of future possibilities for the Greater Toronto Area. These were used as a basis for estimating travel demand in the planning horizon year 2021. The downtown (Planning District 1) resident population range in 2021, as depicted in the scenarios, is from a low of 235,000 people to a high of 405,000, relative to the 1986 level of 133,000 people. Future employment ranges from 571,000 to 617,000 jobs by 2021 in Planning District 1, relative to the 1986 level of 429,000 jobs. The higher growth of population relative to employment reflects City of Toronto and Metropolitan Toronto policies and is consistent with provincial thinking for the GTA.

All five scenarios assumed a total GTA population of 6.0 million people and a total of 3.4 million jobs as also assumed by the *Greater Toronto Area Urban Structure Concepts Study*. In four scenarios, the 2021 population in Metro Toronto was 2.8 million, and in the fifth 3.2 million, while, in all five scenarios, Metro's 2021 job total was assumed to be 1.9 million.

It is, of course, recognized that GTA growth could be slower or faster than is reflected in the above assumptions. Faced with the effects of the current recession, free trade, a crushing debt load, and national unity problems, Canadians are well aware of the economic and social uncertainties that could retard growth. These concerns give urgency to the need to realize the true economic potential of the Central Waterfront and the metropolitan area of which it is a strategic part. The recession provides valuable time to plan and implement change during the slow growth period.

If, on the other hand, growth is faster than anticipated there is even more need to plan boldly and put the necessary infrastructure in place so that the area's quality will be improved as growth occurs. The precise amount of growth by 2021 may vary, but conclusions can be drawn which remain valid while reflecting the range of uncertainty.

The range of resident population levels by 2021 in Planning District 1, represented by the five land-use scenarios studied, is from an increase of about 100,000 people to an increase of about 270,000 people. Assuming an average occupancy of two persons per dwelling unit, this would give a range of between 50,000 and 135,000 additional dwelling units, required to house the growing population. The City of Toronto's target for the coming decade (*Cityplan '91*) is 45,000 new units, of which 35,000 would be in the Central Area, to be achieved by creating major new residential areas, as well as doing some infilling and main street intensification. According to Scenario C





(Nodal), 30 years from now there would be a population of some 328,000 people in Planning District 1, an increase of about 200,000 people.

It is therefore most important to understand that, if the mid to high range of downtown population levels in the Central Waterfront is to be achieved (as, for example, the 200,000 people, or 100,000 units, in Planning District 1, according to Scenario C), and to be accompanied by reduction in pressure for more long commuting trips and the benefits of urban vitality described elsewhere in this report, the City's target for the first decade will have to be achieved again in the second decade and yet again in the third decade.

If we assume that 10,000 of these new units can be met by main street intensification and infilling, another 90,000 units would still have to be added between 1991 and 2021. The dark yellow and olive areas shown in Exhibit 11 total about 300 hectares (750 acres). These areas could accommodate the additional 90,000 units if a gross residential density of three times coverage is assumed. This suggests that sufficient land in the Central Waterfront could be made available through appropriate land-use changes to accommodate intensified residential development at a scale that will help realize the urban development and transportation objectives outlined previously. This calculation assumes that the non-residential uses in mixed-use areas would be additional to the three times coverage residential uses; alternatively, higher residential densities in some areas could achieve the same result on less land.

3.5.4 Mixed-Use Areas

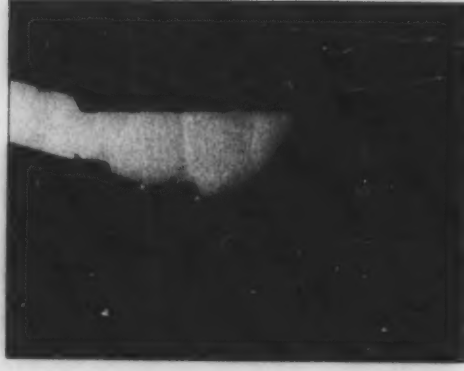
As shown in Exhibit 11, the mixed-use (olive) areas tend to be located in the central part of the area, between Spadina Avenue and Yonge Street, as well as in the adjacent waterfront areas (centred on the proposed new GO stations at Garrison Common and at Cherry Street, respectively), in the East Bayfront, and along the east side of the Inner Harbour between the Keating Channel and the Ship Channel, with a smaller area in the Fleet Street area. These mixed-use areas would be flanked by the residential areas as well as by the green links and parks.

3.5.5 Port/Industrial Areas

Industrial areas would be located in the eastern and southern parts of the Port area and north of Front Street between Bathurst and Spadina. In addition, urban industrial employment opportunities would continue to be located in the mixed-use areas (e.g., Redpath Sugar in the mixed neighbourhood of the East Bayfront, and evolving industrial uses in parts of Garrison Common, particularly north of Exhibition Place).

3.5.6 Summary: A Context for Assessing Road System Concepts

The broad land-use concept shown in Exhibit 11 would be compatible not only with existing and emerging open space and urban development plans and proposals, but with either **retaining** or **removing** the elevated Expressway. It is, therefore, a useful context within which to assess the alternative road systems, as described in Chapter 6. As emphasized in that chapter, however, there are very significant differences among the **retain**, **remove**, and **bury** alternatives for the Expressway, within the overall land-use concept. These differences reflect factors such as green links, built form, and the need for "defensive buildings" adjacent to the elevated Expressway (illustrated in Exhibit 12 for the Bathurst-Spadina Area), as well as the quality of "green roads" (streets that provide an improved pedestrian and cyclist environment through measures such as: wide, continuous sidewalks; continuous, people-oriented street frontage uses; street crossings that facilitate safe pedestrian and cyclist movements; tree planting, street furniture, and other amenities) and other attributes affecting the Central Waterfront's livability and overall quality as a **place**. The improved quality of green roads made possible by removal of the Expressway is illustrated in Exhibit 13, again for the Bathurst-Spadina area.



3.6 THE IMPACT OF THE GARDINER EXPRESSWAY/LAKE SHORE BOULEVARD ON THE CENTRAL WATERFRONT AS A PLACE

An important existing feature of the Central Waterfront as a **place** is the significant barrier effect of the elevated Gardiner Expressway and Lake Shore Boulevard in the area. This is characterized by a break in the continuity of buildings, streets, and land uses. As well, there is overshadowing and visual intrusion by the Expressway and a physical discontinuity caused both by it and by Lake Shore Boulevard where the latter is located beneath the elevated Expressway, forming a stacked, two-tier road facility. The impact varies in different sections of the Central Waterfront, as summarized below, illustrated in the photographs, and described more fully in the technical report.

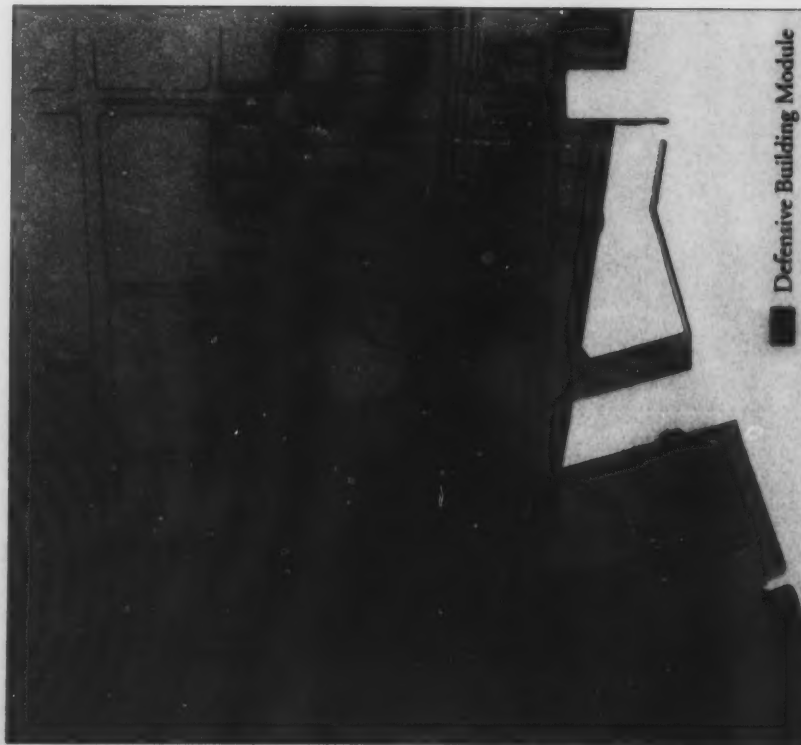
The double barrier effect of the Expressway being stacked on top of Lake Shore Boulevard is most apparent in the central section between Portland and Yonge streets, especially near the ramp intersections with the street system, where there is conflict between ramp traffic and bicycle/pedestrian movements (for example, at Spadina Avenue and at York Street). The impact is amplified by the relatively close proximity of the Expressway to the lakefront in these sections, particularly between Portland and Simcoe streets.



EXHIBIT 12
DEFENSIVE BUILDINGS

RETAIN EXPRESSWAY AND AMELIORATE

Passive, "defensive" building modules face elevated expressway.



REPLACE EXPRESSWAY WITH URBAN BOULEVARD

Active, people-oriented building fronts face urban boulevard.

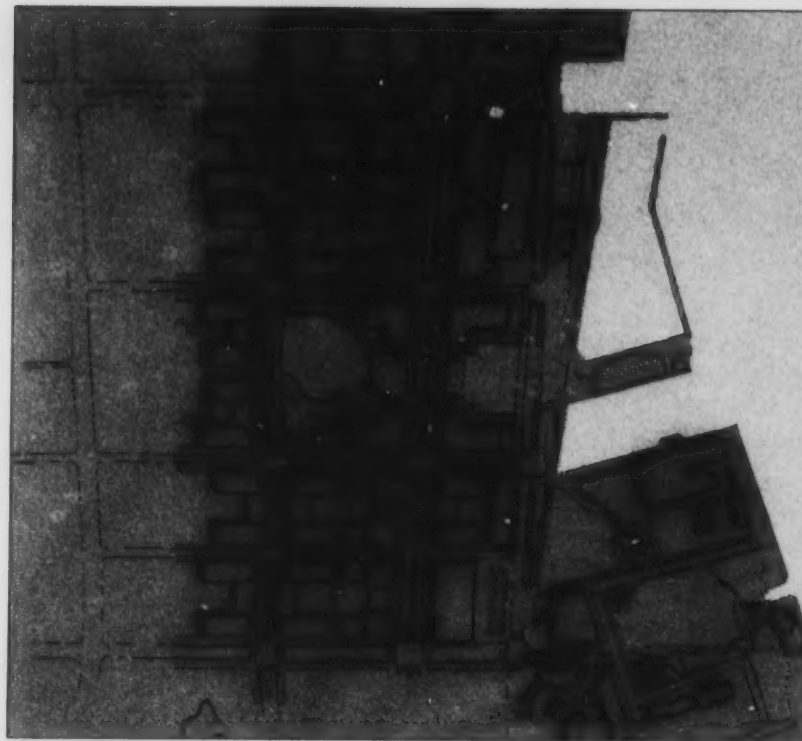
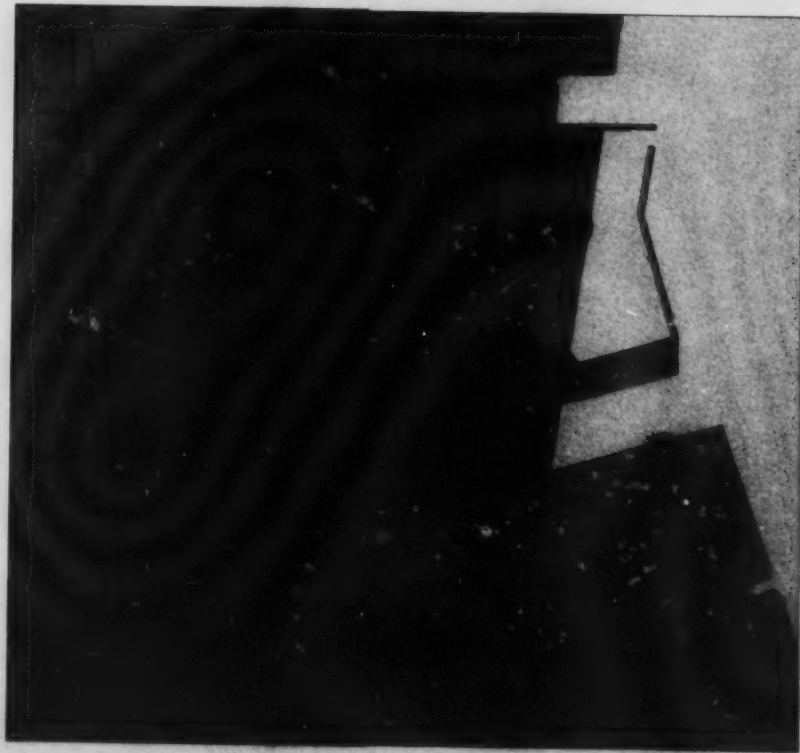


EXHIBIT 13

LEGIBILITY AND CONNECTIONS

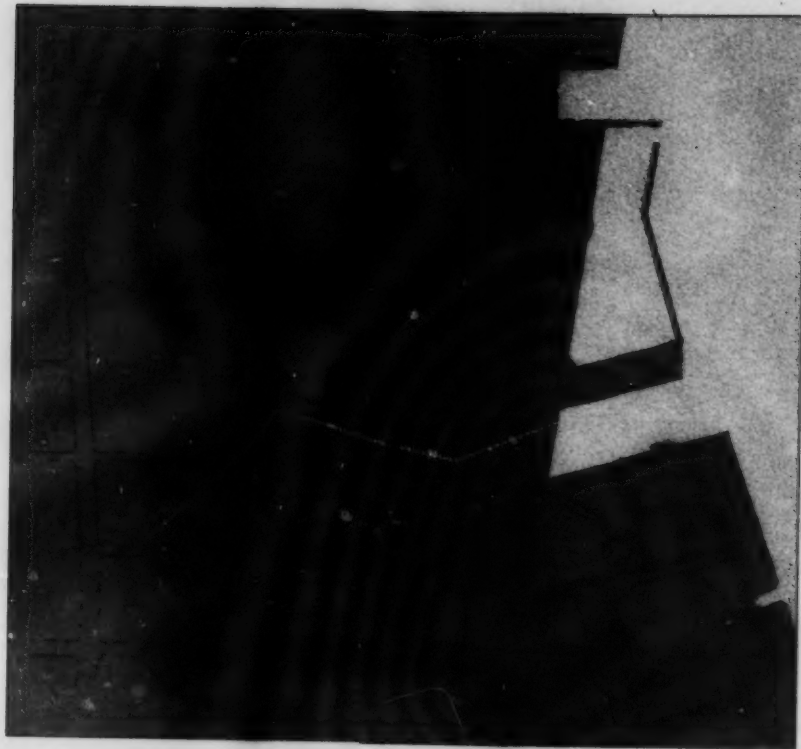
RETAIN EXPRESSWAY AND AMELIORATE

Expressway breaks urban continuity along north-south streets.



REPLACE EXPRESSWAY WITH URBAN BOULEVARD

Higher-quality streets are possible without elevated expressway.





The barrier effect is more visual/psychological and less physical in nature in the section between Strachan Avenue and Portland Street, because Lake Shore Boulevard is not under the Expressway and there are no on/off ramps in this segment. There is an impact on Fort York relative to the lakeshore and waterfront parks to the south. West of Strachan Avenue, the proximity of the Expressway and rail corridor and the lower elevation of the Expressway produce a less noticeable barrier effect. East of Yonge Street, the barrier effect of the Expressway is closely related to that of the rail corridor. The combined impact here may be expected to become more noticeable with redevelopment of the lands in the East Bayfront and Port/Industrial areas and implementation of the Lower Don wetlands and green connector scheme.



As a number of observers have noted, the rail corridor constitutes another east-west barrier between the city and the lake; it could be argued that, if there is serious consideration given to removing the elevated Expressway, there should also be serious consideration of burying or relocating the rail corridor. However, the barrier impact of the latter has been considerably reduced by consolidation of the freight high line with the remainder of the corridor and removal of the rail yards between them. For example, with redevelopment of the Railway Lands, the length of the existing York Street underpass can be reduced to less than half of its present length. The increasing importance of the rail corridor in carrying commuter rail traffic and the massive dislocation which would be caused by attempting to bury the corridor are such that consideration of such measures was excluded from the terms of reference of this study.



West of John Street, the depressed elevation of the rail corridor, coupled with grade changes of adjoining lands, have allowed urban activities to span the corridor and reduce its barrier effect. East of John Street, steps to shorten the underpasses, establish retail activities along the north-south streets, and otherwise improve pedestrian amenities are expected to help reduce the barrier impact.

The attention of the study team was focused in particular on the elevated Expressway between Strachan Avenue and Yonge Street, where it is separate from the rail corridor, closest to the lakefront, and traverses the area of highest land values which has been experiencing the greatest pressure for redevelopment into more diverse, intensive, and urbane uses.

Redevelopment to accommodate such uses, including residential, commercial, urban industrial, and recreational activities, has already occurred adjacent to the elevated Expressway to some degree, and will do so to a greater extent even if the Expressway remains in place. This is being achieved by designing "defensive buildings" adjacent to the Expressway (e.g.,

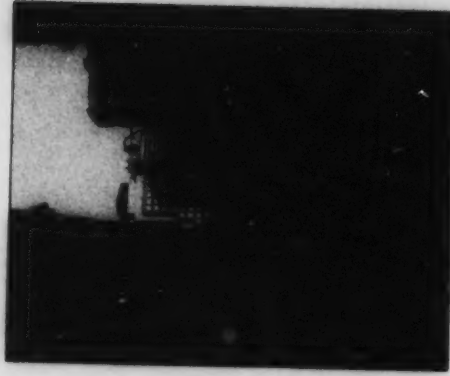
the Harbour Point condominium), in such a way that the lower storeys present largely blank walls to the Expressway, with utilities, parking, and other passive uses located in those parts of the building. Where there is no suitable east-west street, building addresses are located on the north-south streets in the vicinity of the Expressway and it becomes difficult to establish marketable addresses in mid-block locations not served by north-south streets. The value of such building lots may therefore be less than would be the case if the Expressway were replaced by an urban boulevard.

Opportunities for a diverse, street-oriented, people-friendly built environment are substantially reduced and, once these buildings are in place, the opportunity for such an environment is lost for a period equal to the effective lifetime of the buildings. On the other hand, as discussed later, in Chapter 6, if the building designers are aware that the Expressway may be replaced in the relatively short term by an urban boulevard, it is possible to design the buildings so that they could be modified at that time to present a more people-oriented frontage to the new boulevard.

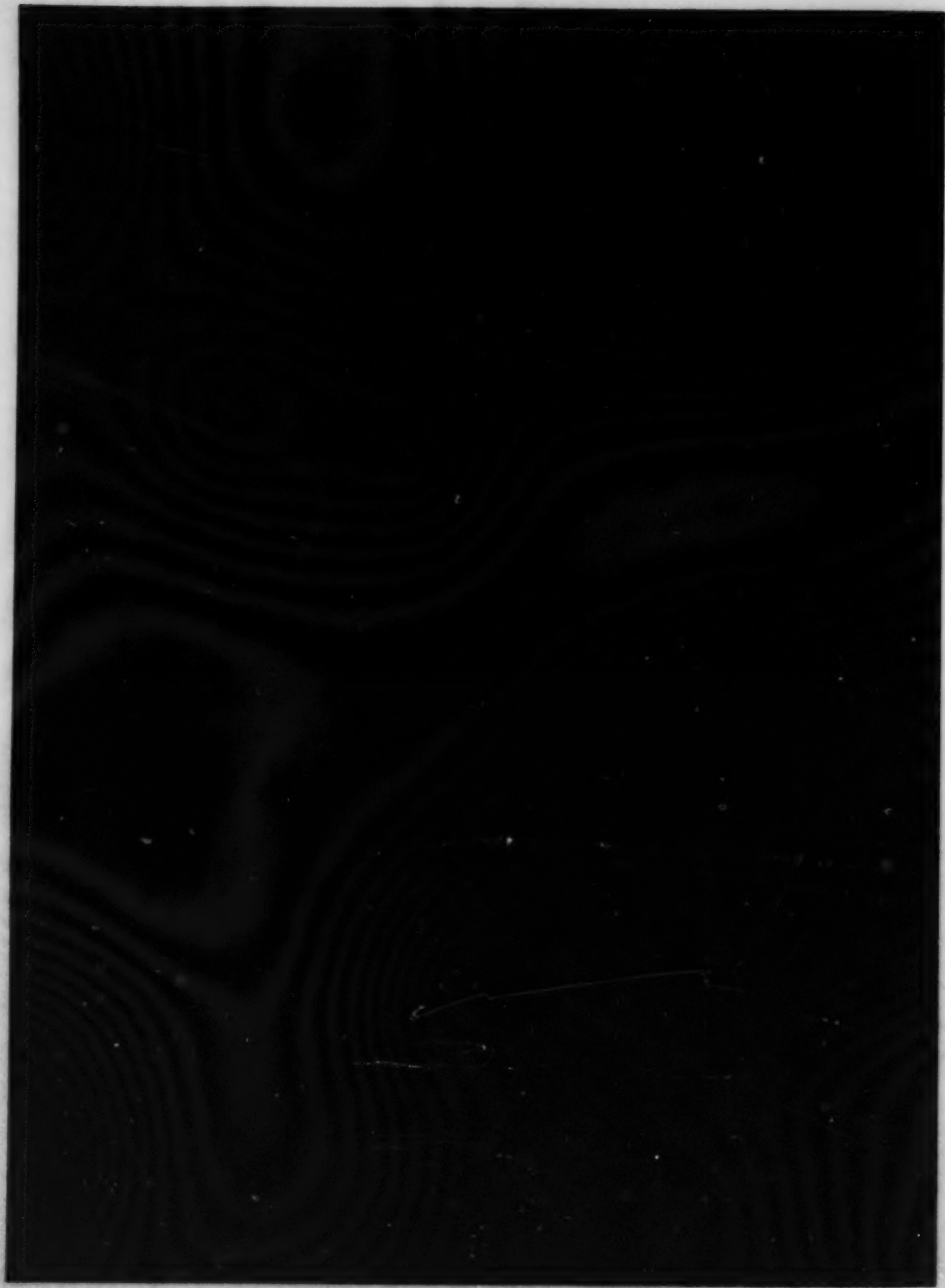
3.7 THE OPPORTUNITY

This generation of Torontonians has a unique opportunity to recapture the Central Waterfront as a part of the city, including appropriate green connections east-west along the shoreline and north-south between the city and the waterfront, with major north-south green areas along the Humber and Don rivers. This opportunity has been created by the massive migration of industrial and freight rail activities outward from the Central Area during the past 30 years, which has freed hundreds of hectares of prime land for other uses.

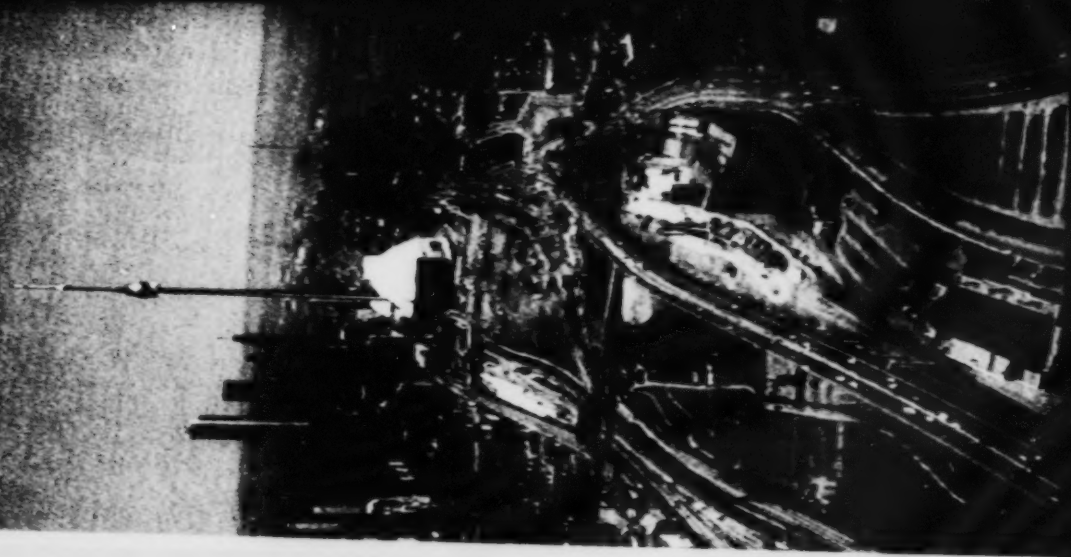
To improve the environment and achieve the Central Waterfront's full potential as a **place**, early establishment of green spaces and links as a positive element of land use, and agreement on transportation and other basic infrastructure, are essential, in addition to integrated plans and designs. Greatly increased housing and attractive residential and mixed-use communities will be a key ingredient in the Central Waterfront to improve its quality as both a **place** and a **corridor**. The transformation to more intensive, diverse, and urbane uses can be expected to be largely completed 15 to 20 years from now. Decisions regarding environmental improvements and urban infrastructure made during the next few years will significantly affect the quality of the resulting **place** as it will be experienced by the next several generations of residents, workers, and visitors in this strategic area.



*"This generation of
Torontonians has a unique
opportunity to recapture
the Central Waterfront
as a part of the city."*



THE CENTRAL WATERFRONT AS A CORRIDOR



4: THE CENTRAL WATERFRONT AS A CORRIDOR

The Central Waterfront is also a strategic **corridor** serving travel by people and the movement of goods to, from, and through the Central Area. Road, rail, marine, and air transportation facilities all play a role, as documented in the Royal Commission's Discussion Paper No. 9, *Waterfront Transportation in the Context of Regional Transportation*. When the term **corridor** is used in this study, it is shorthand for an area devoted mainly to high-speed and efficient transportation, where the easy flow of powered vehicles — trains, autos, and trucks — is the primary function to be served and movements of people on foot, bicycle or wheelchair are given less priority as are other **place** attributes.

As shown in Exhibit 14, the major rail facility is the Lakeshore Corridor, which traverses the Central Waterfront east to west, with additional rail lines merging into this corridor from the Don River corridor in the east and the northwest corridor in the west. GO Transit provides rail commuter services on seven radial lines that converge into these corridors, with the central terminus located at Union Station, on the south side of Front Street between York and Bay streets.

The other most significant transportation facility in the Central Waterfront is the Gardiner Expressway and the associated Lake Shore Boulevard, which pass east-west through the corridor. The Central Waterfront is also served by arterial and local roads that form a sparser network in the south than the more closely spaced urban streets serving the area north of Front Street; this reflects the industrial and institutional uses that have predominated in the area south of the rail corridor during most of the past century. A rail freight spur runs south from the rail corridor to the Port/Industrial Area, connecting to a number of freight spurs there; most other rail freight lines, which used to serve industrial establishments in the Central Waterfront, have been removed following the exodus of industrial customers.

4.1 GOODS MOVEMENTS

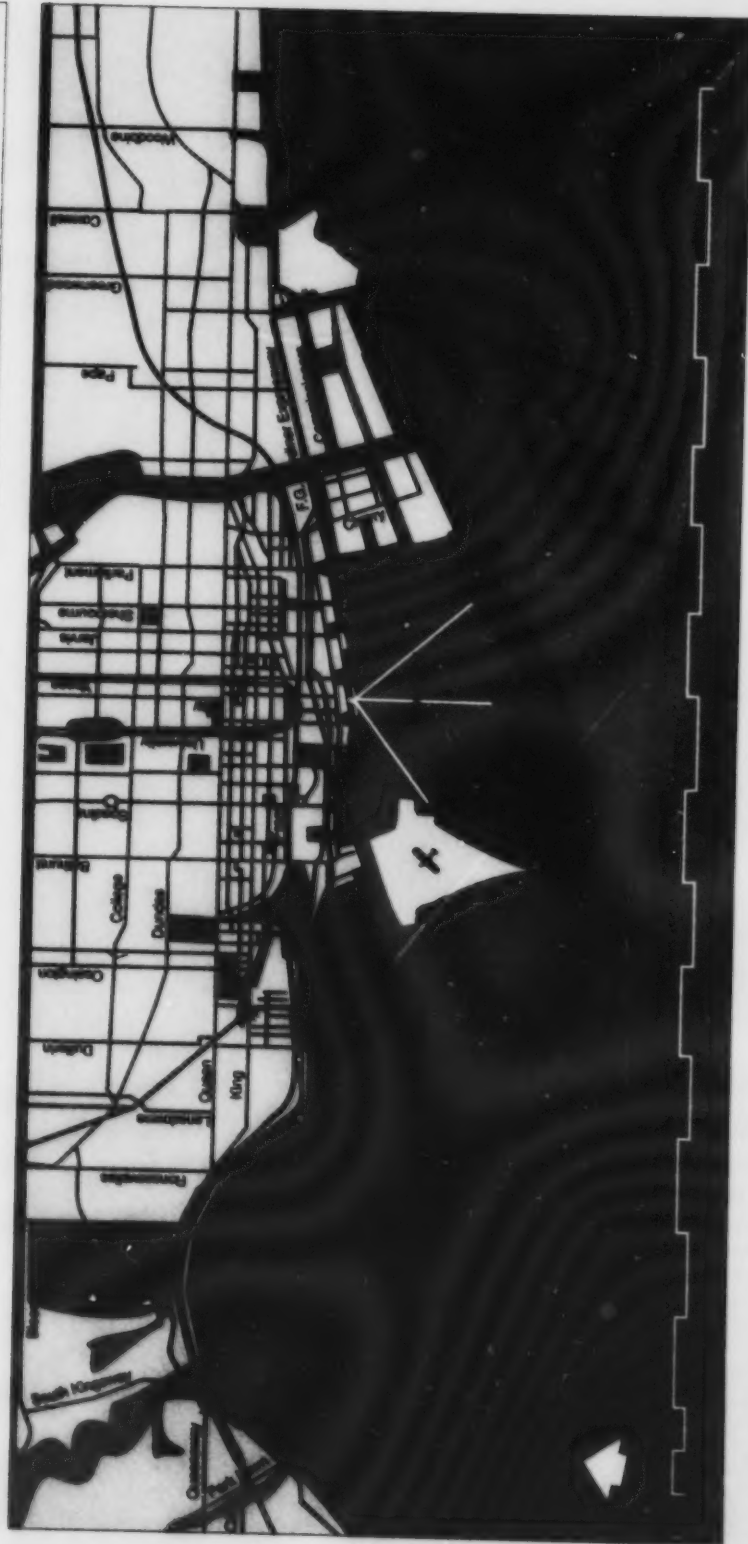
4.1.1 Past Trends

Goods movements make up an important part of the traffic on the roads in the Central Waterfront transportation corridor. In 1990, trucks comprised 10.3 per cent of total vehicle movements east-west into the central part of the Central Waterfront (Queen Street and south) in the a.m. peak hour, 12.0 per cent in the a.m. peak period (three hours), and 14.6 per cent in the 12-hour period. These proportions are virtually unchanged from 1975 for the peak hour and peak period, but are down slightly, from 16.2 per cent in 1975, for the 12-hour period.

Exhibit 15 shows the changes in truck volumes in the Central Waterfront corridor from 1975 to 1990 during the a.m. peak hour, peak three hours, and 12-hour daytime period, as recorded by the Metropolitan Toronto Cordon Count Program. The absolute number of trucks has increased slightly (by 3 to 5 per cent), but there has been a

EXHIBIT 14
EXISTING MAJOR TRANSPORTATION
FACILITIES

LEGEND:	
—	Expressways
—	Arterial Roads
—	Rapid Transit: Subway and Harbourfront LRT
—	Streetcar Lines
—	Railways with GO Service
—	Island Ferries



significant decline (by more than 70 per cent) in the number of heavy trucks (defined in the Cordon Count Program as having three or more axles) at all three times of day. An offsetting increase in light truck traffic (by 70 to 85 per cent, depending on the period of day) accounts for the stability of total truck traffic. As shown in the exhibit, truck traffic on the Gardiner/Lake Shore facility has grown more quickly than that in the Central Waterfront corridor: by 8-12 per cent from 1975 to 1990 on the Gardiner/Lake Shore versus 3-5 per cent in the corridor.

4.1.2 Future Truck Volumes

Exhibit 15 also shows projected 2021 truck volumes inbound on the Gardiner Expressway/Lake Shore Boulevard, across the Bathurst Street and Don River screenlines, and on all roads between Lake Ontario and Queen Street across the same two screenlines. These volumes are also given for the a.m. peak hour, the a.m. peak period, and the 12-hour daytime period. Light truck trips are projected to increase in proportion to total employment in the Central Area while heavy truck trips are projected to remain essentially constant because no growth is expected in heavy manufacturing employment in the Central Area. The ranges given for the 2021 volumes reflect the range of Planning District 1 employment forecasts corresponding to the five land-use scenarios described in Section 3.5.3. Because they are based on this relatively simple methodology, the truck traffic projections should be regarded as approximations only.

The number of truck trips on the Gardiner/Lake Shore passing through the Central Area in 1986 was estimated to be between 250 and 350 vehicles (total in both directions) in the peak hour, of which about 25 per cent (60 to 90 trucks per hour) were heavy trucks. Applying the above method for estimating the growth in truck trips results in an estimate of between 300 and 475 through truck trips in 2021, of which about 20 per cent are estimated to be heavy truck trips.

EXHIBIT 15
TRUCKS ENTERING CENTRAL
WATERFRONT ACROSS BATHURST &
DON RIVER SCREENLINES
(QUEEN ST. TO LAKE ONTARIO
FROM EAST & WEST)

PEAK Hour 0745-0845	Light Trucks	Heavy Trucks	Total Trucks	Trucks on Gardiner/ Lake Shore	Growth	Range
PEAK 3 Hours 0700-1000	880	1,630	+85%	2,090-2,270	+28% to +39%	
	870	210	-76%	210	0%	
	1,750	1,840	+3%	2,300-2,400	+25% to +35%	
	1,180	1,270	+8%	1,570-1,680	+24% to +32%	
DAILY 12 Hours 0630-1830	2,970	5,050	+70%	6,460-7,020	+28% to +39%	
	2,600	720	-72%	720	0%	
	5,570	5,770	+4%	7,180-7,740	+24% to +34%	
	3,740	4,100	+10%	5,040-5,410	+23% to +32%	
DAILY 12 Hours 0630-1830	10,880	18,770	+73%	24,030-26,090	+28% to +39%	
	10,100	2,870	-72%	2,870	0%	
	20,980	21,640	+3%	26,900-28,960	+24% to +34%	
	14,240	15,880	+12%	19,530-20,960	+23% to +32%	

4.2 PERSON TRAVEL

4.2.1 Travel Patterns

In 1986 there were almost two million trips made during the morning peak period (trips starting between 6:00 a.m. and 8:59 a.m.) as shown by the Transportation Tomorrow Survey (TTS) for the extended GTA (including Hamilton-Wentworth). Some 318,000 peak period trips, or 16 per cent, were destined to the Central Area of Toronto. Of these, approximately 36,000 were from the Central Area, 219,000 from the remainder of Metro, and 64,000 from the regions outside. The highest volume from the regions outside Metro originated in Peel Region — 28,000 trips destined to the Central Area.

The same survey revealed that, in 1986, about 65 per cent of GTA travel in the a.m. peak period was by private car and 25 per cent by public transit, with the remaining 10 per cent being on foot, by bicycle, and by other modes. In contrast, only 36 per cent of trips to the Central Area were by automobile and 58 per cent by public transit.

Of trips **within** the Central Area, only 34 per cent were by public transit because of the relatively high proportion, about 40 per cent, of trips by "other" modes (e.g., walking — 36 per cent, cycling — 2 per cent, and taxi/motorcycle — 2 per cent). The survey shows that walking is the most common mode for trips within the Central Area.

From the rest of Metro to the Central Area 63 per cent of the trips were by public transit. The proportion of public transit trips from the regions beyond Metro Toronto to the Central Area ranges from 54 per cent to 60 per cent.

4.2.2 Central Area Traffic

Metropolitan Toronto, in co-operation with other agencies, has undertaken a consistent system of traffic counts from 1975 to date through its Cordon Count Program as referred to earlier. Exhibit 16 provides a comparison of 1975 and

EXHIBIT 16
1975-1990 TRAFFIC GROWTH AT
THE CENTRAL AREA CORDON

		1975		1990		%Change		1975		1990		%Change	
Road Vehicles	AUTOS	32,061	34,837	8.7%	81,485	89,940	10.4%	227,895	268,829	18.0%	227,895	268,829	18.0%
	TRUCKS	3,138	3,844	22.5%	9,643	11,650	20.8%	36,458	41,995	15.2%	36,458	41,995	15.2%
	TRANSIT	341	401	17.6%	955	1,070	12.0%	3,136	3,467	10.6%	3,136	3,467	10.6%
	TOTAL	35,540	39,082	10.0%	92,083	102,660	11.5%	267,489	314,291	17.5%	267,489	314,291	17.5%
Persons	AUTOS	43,201	43,194	-	107,137	110,144	2.8%	297,855	333,567	12.0%	297,855	333,567	12.0%
	TRANSIT	74,345	82,464	10.9%	150,904	169,495	12.3%	305,345	366,017	19.9%	305,345	366,017	19.9%
	GO-RAIL	6,488	21,586	232.7%	10,082	36,198	259.0%	12,244	40,814	233.3%	12,244	40,814	233.3%
	TOTAL	124,034	147,244	18.7%	268,123	315,837	17.7%	615,444	740,398	20.3%	615,444	740,398	20.3%

1990 vehicle and person trips crossing the Central Area cordon inbound for the a.m. peak hour, a.m. peak period (from 7 a.m. to 10 a.m.), and the 12 hours between 6:30 a.m. and 6:30 p.m.). As noted earlier, the Central Area cordon is defined by Bathurst Street on the west, the CP Rail North Toronto line north of Dupont in the north, and the Don River to the east. The number of vehicles crossing this cordon inbound increased 10.0 per cent, 11.5 per cent, and 17.5 per cent for the a.m. peak hour, the a.m. peak period, and the 12-hour daytime period respectively. Person trips across this cordon increased by 18.7 per cent, 17.8 per cent, and 20.3 per cent for the same three time periods.

Total person movements in the three-hour a.m. peak period inbound to the Central Area increased from 268,000 in 1975 to 316,000 in 1990. This represents a total increase of 18 per cent or an annual increase of 1.1 per cent compounded. As shown in Exhibit 16, this total change masks some significant relative shifts between the auto and transit modes.

The mode of travel showing the greatest increase is the GO Transit commuter rail network, with an increase of some 259 per cent in the a.m. peak period from 1975 to 1990. Other public transit has increased as well, although its share of the overall demand has declined slightly. In this period, the number of passengers in automobiles and taxis entering the Central Area cordon in the morning peak was essentially constant and its modal share dropped from 40 per cent to 35 per cent. At the same time, the number of automobiles increased because of decreasing car occupancy. Auto occupancy in the a.m. peak period declined from 1.31 persons per car in 1975 to 1.22 in 1990. This means that the same number of vehicles were carrying 7 per cent fewer people in 1990 than they carried in 1975.

EXHIBIT 17
PAST/FUTURE CENTRAL AREA TRAVEL



Using information from the Toronto Transit Commission to supplement these data, trends going back to 1960 can be examined. These are shown in Exhibit 17. It shows that, over these 30 years, there has been a trend upwards in total person trips entering the Central Area in the a.m. peak period but the number of persons entering in automobiles has actually declined slightly. The range of future estimates was made by the Study Team based on the five land-use scenarios already described.

4.2.3 The Central Waterfront Corridor

Exhibit 18 shows data within the Central Waterfront corridor itself (defined as running from the north side of Queen Street to Lake Ontario), specifically the 1975 and 1990 east-west flows inbound to the centre across two major screenlines, Bathurst Street and the Don River.

Between 1975 and 1990 the number of vehicles travelling into the Central Waterfront corridor from the east and west grew very little in the a.m. peak hour (by one per cent) and

only modestly in the a.m. peak period (by 6 per cent), but more significantly in the 12-hour period (by 15 per cent). This suggests that the road network in the waterfront corridor has been operating near its capacity since 1975, restricting increases in vehicle traffic during the peak periods. The more significant growth in the 12-hour vehicle traffic may reflect a further spread in work trip peak periods in the waterfront corridor and/or increasing numbers of non-work trips.

There were similar traffic trends on the Gardiner Expressway/Lake Shore Boulevard facility at the same screenlines: between 1975 and 1990, auto traffic on the Gardiner/Lake Shore grew from 10,580 to 10,780 vehicles in the a.m. peak hour (a growth of 2 per cent), from 27,500 to 28,900 (5 per cent) in the a.m. peak three hours, and from 75,200 to 87,600 (17 per cent) in the 12-hour daytime period.

The numbers of person trips into the waterfront corridor had a growth pattern different from that for vehicle traffic; as shown in Exhibit 19, person trips in the corridor grew substantially in all three time periods: by 32 per cent in the a.m. peak hour, 28 per cent in the a.m. peak period, and 22 per cent in the 12-hour daytime period. In other words, the concentration of total person trips into the peak hour and the peak period increased; this is in contrast to the surface transit and automobile traffic trends.

With the exception of the 12-hour period, in which auto person trips also grew noticeably, the growth in person trips over the 15 years was due mainly to growth in the number of persons carried by G.O. Transit commuter rail services. The number of persons entering the Central Waterfront from the west and east on other forms of public transit declined between 1975 and 1990 in all three time of day periods.

4.2.4 Origins and Destinations

In May 1986, the City of Toronto traced actual users of the Gardiner Expressway, recording licence numbers and sending registered owners a questionnaire. Exhibit 20 shows the origins and destinations of vehicles on the Gardiner Expressway in the 7:00-9:00 a.m. peak period using the on and off ramps between Spadina and Sherbourne in the Central Area. On the western approach at Bathurst Street, for example, 5,500 out of 7,900

EXHIBIT 18
ROAD VEHICLES ENTERING CENTRAL
WATERFRONT ACROSS BATHURST &
DON RIVER SCREENLINES
(QUEEN ST. TO LAKE ONTARIO
FROM EAST & WEST)

	1975	1990	% Change
PEAK HOUR			
AUTOS	15,590	15,770	+1%
TRUCKS	1,750	1,840	+5%
TRANSIT	190	140	-24%
TOTAL	17,530	17,750	+1%
PEAK 3 HOURS			
AUTOS	39,460	41,970	+6%
TRUCKS	5,560	5,780	+4%
TRANSIT	480	410	-15%
TOTAL	45,500	48,160	+6%
DAILY 12 HOURS			
AUTOS	106,700	125,160	+17%
TRUCKS	20,970	21,640	+3%
TRANSIT	1,600	1,410	-12%
TOTAL	129,270	148,210	+15%

EXHIBIT 19

PERSONS ENTERING CENTRAL WATERFRONT ACROSS BATHURST & DON RIVER SCREENLINES (QUEEN ST. TO LAKE ONTARIO FROM EAST & WEST)

	1975	1990	CHANGE	2021	CHANGE VS. 1990
PEAK HOUR 0745-0845					
Auto	20,920	19,210	-8%	N/A	
Transit	7,890	6,080	-23%	N/A	
Go-Rail	6,820	21,590	+216%	N/A	
Total	35,630	46,880	+32%	79,200 to 111,000	+69% to +137%
PEAK 3 HOURS 0700-1000					
Auto	51,330	51,030	-1%	N/A	
Transit	17,800	14,270	-20%	N/A	
Go-Rail	10,080	36,190	+259%	N/A	
Total	79,210	101,490	+28%	175,600 to 238,800	+73% to +135%
DAILY 12 HOURS 0600-1800					
Auto	138,230	154,960	+12%	N/A	
Transit	39,070	35,630	-9%	N/A	
Go-Rail	12,240	40,810	+233%	N/A	
Total	189,540	231,400	+22%	N/A	

EXHIBIT 20

1986 A.M. PEAK TWO HOURS AUTO TRIP DISTRIBUTION FOR CENTRAL GARDINER EXPRESSWAY 1

EASTBOUND TRIPDISTRIBUTION
GARDINER EXPRESSWAY

TRIP ORIGIN FOR AUTO TRIPDISTRIBUTION
THE CENTRAL GARDINER OFF RAMP

WESTBOUND TRIPDISTRIBUTION
GARDINER EXPRESSWAY

Western Metro Toronto ²	2,354	23%
Northern Central Metro ³	31	0%
North of Metro	16	0%
West of Metro	5,474	54%
Subtotal	7,875	78%
Internal Central Area	24	0%
Through Traffic	2,227	22%
TOTAL AUTO VOLUME	10,126	100%

1. A.M. Peak Period is defined as 7:00 A.M. - 9:00 A.M.; Central Gardiner Expressway is from the Spadina Ave. to Scarborough St. ramps.
2. 'Western Metro Toronto' is the area to the west of a line along Bathurst St., Eglinton Ave., Allen Rd. and Dufferin St.
3. 'Northern Central Metro' is the area to the east of 'Western Metro Toronto', to the west of Scarborough and excluding the downtown area of Toronto.
4. Information is based on the 1986 Central Bayview Study - Phase II, License Plate Survey.

1. A.M. Peak Period is defined as 7:00 A.M. - 9:00 A.M.; Central Gardiner Expressway is from the Spadina Ave. to Sherbourne St. ramps.
2. 'Western Metro Toronto' is the area to the west of a line along Bathurst St., Eglinton Ave., Allen Rd. and Dufferin St.
3. 'Northern Central Metro' is the area to the east of 'Western Metro Toronto', to the west of Scarborough and excluding the downtown area of Toronto.
4. Information is based on the 1986 Central Bayfront Study - Phase II, License Plate Survey.

autos exiting into the Central Area came from west of Metro — that is, from Peel Region or further west or north. This represents 70 per cent of the traffic exiting the Expressway in the Central Area and 54 per cent of the total traffic. Through traffic represented approximately 22 per cent of the total volume on the Expressway inbound at Bathurst Street from the west and 39 per cent of the smaller volume inbound from the east at the Don River crossing, some 2,200 auto trips from the west and 2,300 from the east in the same two-hour period, about 1,100-1,200 per hour in each direction.

To investigate the origins and destinations of through trips, a separate analysis was done for the present study. The traffic flow patterns of surveyed 1986 origin-destination movements were simulated by means of a computer model, to estimate their likely distribution on roads in the expressway network and the arterial street system; the origins and destinations of trips using the Gardiner Expressway and Lake Shore Boulevard were then tabulated. It was found that a higher proportion of through traffic trips (53 to 60 per cent) are destined to or originate **within** Metropolitan Toronto than is the case for traffic originating in or destined to the Central Area. This suggests that other roads, in particular Highway 401, carry the main volume of through trips which both start and end **outside** of Metro Toronto.

4.2.5 Future Person Travel Volumes in the Central Waterfront

Exhibit 19 also shows the estimated **future** volumes entering the central part of the study area, eastbound across Bathurst Street (from Queen Street to the lake), and westbound crossing the Don River (from Queen Street to the lake). It is estimated that the number of persons entering the Central Waterfront will grow from about 46,900 in 1990 to a range of 79,200-111,000 in 2021, an increase of between 69 and 137 per cent. In absolute terms, this represents a range of about 32,000 to 64,000 **additional** trips per hour, with the lower end of the range corresponding to scenarios with relatively more housing in the Central Area and the higher end to relatively less housing in the Central Area.

These results suggest that it would be prudent to plan for a public transportation system capable of carrying between 40,000 and 60,000 additional persons into the central part of the study area (south of Queen Street) in the peak hour. Up to 30,000 to 45,000 or more of these additional person trips logically would be carried on GO Transit. Depending on the land scenario being used, added demand of from 2,500 to 5,000 passengers per hour might be expected on other east-west transit facilities leading to the Central Waterfront from east and west. This would be divided among a number of routes on the rapid transit and surface systems.

Compared to this expansion in transit travel, the largest increases in estimated road system demand by 2021 under the various land-use scenarios (assuming the currently planned expansion of road capacity) may only be as much as some 6,400 person trips by auto or 5,300 autos per hour from the west and about 3,500 person trips by auto or 2,900 autos per hour from the east, if existing auto occupancy levels remain and if there are no enhancements to the transit system, as suggested by this study and described in Section 4.3. By contrast (as described more fully in Chapter 6), none of the road system concepts studied for the Central Waterfront has a comparable increase in auto capacity. The largest increase is 1,000 autos per hour (1,200 person trips per hour by auto at present auto occupancy levels) from the west and 1,600 autos per hour (1,950 person trips per hour by auto) from the east.

It is therefore probable that virtually all of the increase in projected peak-hour demand for travel to the Central Area will have to be handled by the public transit system, regardless of changes to the Gardiner Expressway. If the Expressway were removed, future transit capacity needs would be further increased, but only marginally (by up to 5,300 peak-hour inbound travellers who formerly used the auto mode) relative to the substantial transit capacity increases (up to 60,000 additional peak-hour person trips) estimated to be needed during the next 30 years if the growth in total person trips is to be accommodated by transit.

4.2.6 Pedestrian and Cycle Traffic

Unfortunately, statistics on volumes of pedestrian and cycle traffic in the Central Waterfront and adjacent areas are not collected to the same extent as for vehicular travel by road and transit. The Transportation Tomorrow Survey (1986) revealed, however, that during the a.m. peak three hours about 12,600 trips or 36 per cent of total person trips made entirely **within** the Central Area were pedestrian trips. This was the most-used method of travel for trips within the Central Area, more than the number of transit trips within the area and almost half again as high as the number of auto trips. The number of peak-period cycle trips was much smaller: 870 trips or about 2 per cent of the total.

It is clear that, within the Central Waterfront, volumes of pedestrians and cyclists between the City and the Bayfront have increased with the development of SkyDome and the residential community along Queen's Quay. This has also been the case for east-west movements, in particular along the waterfront, in conjunction with the development of recreational and cultural attractions at Harbourfront. As the Central Waterfront continues to diversify, volumes of pedestrian and cyclist traffic can be expected to increase significantly — particularly the former — which will emphasize the need for improved sidewalks, more pedestrian-friendly streets, and mid-block connectors for both pedestrian and cycle traffic.

4.2.7 Conclusions

The major conclusions from these findings are as follows:

- Future travel demand into the Central Waterfront in the a.m. peak hour will increase with additional development. Depending on the balance between population and employment in the Central Area and other urban structure changes in the GTA, we may expect increases in peak-hour travel to the Central Waterfront (from east and west combined) of between 32,000 and 64,000 person trips by 2021 relative to 1986 levels.
- Increasing the level of population relative to employment in the Central Area and achieving more compact, mixed-use (nodal) urban structure in the Greater Toronto Area would significantly reduce the demand for travel into the Central Waterfront, resulting in peak-hour increases by 2021 at the lower end of the range (i.e., 30,000 to 35,000 person trips in the peak hour). In the absence of such land-use policies, the higher end (an increase of up to 60,000 to 65,000 peak-hour trips) is likely;
- Virtually all the increase in person trips into the Central Waterfront and Central Area will have to be handled by public transit, and the majority of this increase by GO Transit: about 85 per cent of the increase in travel is expected to be from the regions outside Metro.
- The increase in GO Transit ridership demand in the peak hour into the centre is estimated to be in the range of about 30,000 to 45,000 or more person trips (relative to the 1991 level of about 26,000 peak-hour person trips on GO Transit), depending on the Central Area population and employment balance, the GTA urban structure, and the road system available in the future.

4.3 THE ROLE OF TRANSIT

Several transit system concepts for providing this substantial increase in service were considered and the following conclusions reached:

- Demand for travel into the Central Area can best be met by improving GO Transit services, reflecting the projection that 85 per cent of the growth in person trips to the Central Area between now and 2021 will originate in suburban areas beyond the boundaries of Metropolitan Toronto. These are areas now served by GO Transit for which additional service is planned.
- The capability exists for improving GO Transit line haul capacity and, in fact, GO Transit has several such projects under way.

"Virtually all the increase in person trips into the Central Waterfront and Central Area will have to be handled by public transit."

*“Increasingly, transit
is the key for economic
development in large urban
regions ... particularly
in central areas.”*

- Train movements and passenger capacity in Union Station itself can be expanded to handle these volumes. The problem will be the distribution of these passengers from Union Station into the Central Area and Central Waterfront, particularly those who need to use the Union subway station and the local transit system.
- It would be possible to relieve some of the pressure on Union Station by constructing “shoulder” GO Transit stations and/or operating some service into the North Toronto (CP) station, offering transfers to the Yonge subway at Summerhill station, and to the Spadina subway at Dupont station. However, GO service to these stations would offer only marginal relief to Union Station and a significant increase in passenger volumes will have to be handled on the Lakeshore rail corridor, prompting the need for shoulder stations — at Garrison Common (Strachan Avenue) in the west and Ataratiri (Cherry Street) in the east — to help achieve ridership diversion from Union Station.
- Various transit improvement alternatives are possible that will provide extra distribution capacity, thereby improving the effectiveness of the proposed shoulder GO Transit stations in diverting passengers from Union Station. Also, greatly improved transit service should be provided throughout the Central Waterfront and Central Area to serve intensified residential, employment, and recreational uses there.
- Based on preliminary analysis, one attractive strategy is the development of an LRT distributor loop linking the Cherry Street and Garrison Common stations with the waterfront and with major employment areas in the downtown, as illustrated in Exhibit 21. Extending the Spadina subway south to Union Station, and the University Avenue subway south to the waterfront, as shown, would be desirable in the longer term. Initially, bus and LRT service on the arterial roads in the Central Waterfront, with transit-priority and high-occupancy vehicle (HOV) lanes as appropriate, would be used to provide the expanded feeder/distributor functions, with construction of the LRT loop system following in a second stage, as warranted by development.
- Other transit service enhancement initiatives were also considered, such as HOV/express bus lanes on the Gardiner Expressway and other major roads, and the potential for more efficient, higher-capacity service on the King and Queen streetcar routes by initiating transit priority measures, although no rigorous demand or capacity analyses of such options were possible in the scope of this study. At present, Metropolitan Toronto is undertaking an HOV study and the City of Toronto is promoting the King and Queen streetcar service priority measures mentioned. The results of these investigations will be known in due course; however, the increase in transit system ridership that might result from any or all of these measures would be only a relatively small proportion of the total forecast increase in transit demand to, from, and within the Central Area. Consequently,

the need would still exist for part or all of a major transit system improvement program, such as the one outlined here, to be put in place.

Increasingly, transit is the key for economic development in large urban regions. It is, of course, essential that local and regional road access continue to be available for both automobile and truck traffic serving local land uses, but, increasingly, the key indicator of accessibility is the availability of surface and rapid transit services, particularly in central areas.

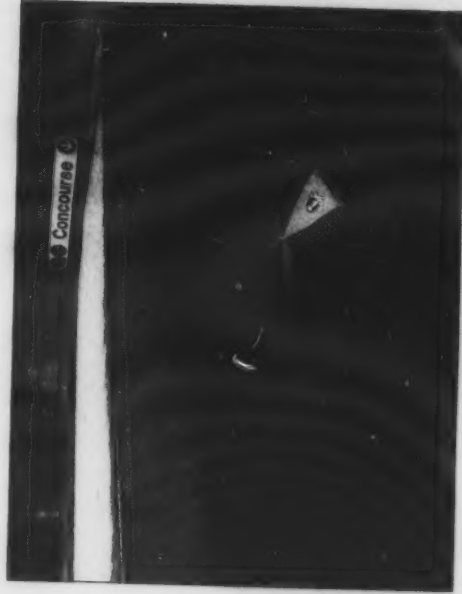
There are many examples of this reliance on transit: in New York City, the World Financial Center development at Battery Park in Lower West Side Manhattan was initiated a few years after the West Side Highway had collapsed, despite the fact that the road was never replaced with a limited-access facility, because the developer knew that high-capacity rapid transit services were available. Similarly, the Canary Wharf development in the London Docklands is in an area not served by limited-access roads; the developer realized that high-quality rapid transit links are essential and, therefore, indicated a willingness to consider providing significant front-end funding for such facilities. Closer to home, rapid office/commercial development has occurred in the North York City Centre and more recently in the Scarborough City Centre following the extension of rapid transit lines to each of them, linking them to the downtown and the rest of the Greater Toronto Area.

4.4 THE ROLE AND FUTURE OF ROAD TRANSPORTATION

Chapter 8 of the Technical Report includes a discussion of the current role, strengths, weaknesses, environmental targets, and technological trends affecting automotive transportation. There is also a discussion of mode choice and the outlook for transportation management, including possible future major initiatives to introduce direct pricing for the use of roads (by electronic means), with higher prices charged for the use of congested roads during peak periods and lower or zero prices charged for other uses.

Based on this discussion, our conclusions can be summarized as follows:

- Automotive transportation is an essential element of the economic and social well-being of the Greater Toronto Area and can be expected to remain so for the foreseeable future. The degree of auto dependence can, however, be influenced by various land-use, transportation, pricing, and regulatory policies. Environmental concerns are a major factor leading to policies that may strongly influence the nature and future role of automobiles.



•

"Stabilization or reduction of vehicle-kilometres of auto travel will be required if we are to achieve the significant reductions in automotive energy consumption and emissions made possible by technological developments."

•

Over the next 30 years, technological developments may make possible substantial reductions in energy consumption and/or vehicular emissions **per vehicle-kilometre**, but **absolute** reductions in energy consumption and the impact on the environment would require greatly improved transit and changes to land use/urban structure. These will be needed in order to reduce average trip lengths, encourage transit use, and motivate behavioural change to divert discretionary travel from cars to transit, cycling, and walking. Stabilization or reduction of vehicle-kilometres of auto travel will be required if we are to achieve the significant reductions in automotive energy consumption and emissions made possible by technological developments.

• If proposed changes in urban structure and substantial improvements in public transportation systems can be achieved, most or all future increases in peak-period person trips to the Central Area through the Central Waterfront can be carried by improved public transportation, but it is possible that there may still be an absolute increase in autos and trucks attempting to enter the Central Area in peak periods.

• If, in this context, the most favourable scenario of land-use changes and improved public transit can be achieved, it is likely that future peak-period automotive traffic volumes entering and leaving the Central Area can be maintained at existing levels or reduced somewhat, but it is difficult to estimate the likelihood that the latter could be achieved. To do so could require additional transportation management measures such as Central Area parking supply and price management or, possibly, road pricing, as well as the land-use and transit policies described above.

• In the absence of favourable land-use policies or other transportation management measures, capping or reducing the number of vehicular trips entering and leaving the Central Area could also be achieved directly by capping or reducing the road capacity for such trips and, at the same time, providing increased transit. This would lead, at least initially, to increased traffic congestion and a corresponding increase in the length of peak periods. The increased congestion could exacerbate the impact on the local environment (e.g., automotive emissions) and social problems resulting from increased commuting times, and could act as a constraint on economic growth in the area.

• Experience on roads entering the Central Waterfront from east and west, Queen Street to the lake shore (including the Gardiner/Lake Shore facility as described earlier), indicates that, while **peak-period** auto plus truck plus transit vehicle volumes have been effectively capped due to capacity restraints (volumes grew only 5.8 per cent in 15 years), the peak periods continued to spread beyond the traditional 7:00-to-10:00 a.m. and 4:00-to-7:00 p.m. periods. This occurred to the extent that **daily** (6:00 a.m. to 6:00 p.m.) auto plus truck plus transit vehicle volumes grew over the same 15-year period, by a relatively modest 14.6 per cent.

- If no additional road-capacity increases were provided and if the land-use and transit improvements outlined earlier were made, the Gardiner/Lake Shore and related arterial roads would likely continue to function largely as they do now **in the peak periods**. But modest increases in **daily** automotive traffic would probably continue and peak periods would likely get longer, unless additional disincentives for discretionary auto trips were also introduced.

In view of these conclusions, it would seem prudent to plan for sufficient road and transit capacity to serve at least the lower end of the range of automobile and person trips estimated under the five land-use scenarios considered in this study. If possible, however, a flexible approach should be adopted so that advantage could be taken later of reduced automobile traffic levels, if these are achieved in the medium to longer term as a result of land-use and transit improvements and possibly due to other environmental, energy, and related policy initiatives affecting the use of automobiles.

4.5 CORRIDOR MODAL ROLES ARE CHANGING

4.5.1 Goods Movements

It is interesting to note that the Gardiner Expressway, which was planned and constructed between 1955 and 1965, was built in an area that, at that time, was essentially industrial in character. The Expressway served dual functions: it provided an efficient route for goods movements, in particular heavy truck movements between the Port area, industrial areas in southern Etobicoke, and other industrial activities in the Central Area; and it offered a radial route for automobile traffic entering the Central Area from the west and east, as well as a through connection to and from the lower end of the Don Valley Parkway in the east.

In parallel with the outward migration of heavy industry, there has been a reduction in heavy truck traffic into the Central Waterfront (from east and west combined), from 870 peak-hour trips in 1975 to 210 peak-hour trips in 1990, a reduction of 76 per cent over 15 years. There has been an offsetting increase in traffic generated by smaller, two-axle trucks during the same period (from 880 peak-hour trips to 1,630 peak-hour trips, an increase of 85 per cent). This trend is associated with increased use of courier and service vehicles, as well as goods movements, to serve the growing office, commercial, and urban industrial activities in the Central Area and Central Waterfront. Smaller vehicles serving these Central Area uses tend to use the arterial road network in any case, and are more compatible as a component of arterial traffic than are the heavier trucks — those with three or more axles.

*"If possible...
a flexible approach
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use of automobiles."*

Based on these trends, it can be argued that one of the original purposes of the Gardiner Expressway, to carry heavy truck traffic in a largely industrial area, has been significantly decreased because of the economic and land-use trends described above.

4.5.2 Person Movements

The other major purpose of the Expressway, as a radial commuter route for trips from outside Metro Toronto to the Central Area, has continued, but this role is also declining, relatively and absolutely. The Expressway's character as a commuting facility has, in the same 15 years, declined in comparison to that of its major competitor for such trips, GO Transit; while the number of a.m. peak-hour person trips carried to the Central Area by the Gardiner Expressway was **declining** from about 10,500 to 8,000, the number carried by GO Transit was **increasing** from about 6,800 to about 21,600, and has increased further to about 26,000 in 1991.

In **relative** terms, the proportion of total person trips carried by the Gardiner Expressway to the Central Area declined between 1975 and 1990: from 8.4 per cent of the total to 5.4 per cent during the a.m. peak hour; from 10.4 per cent to 6.9 per cent during the a.m. peak three hours; and from 13 per cent to 10 per cent of the total during the 12 hours between 6:30 a.m. and 6:30 p.m. In **absolute** terms, the number of persons carried by auto on the Expressway has also declined over the same 15-year period, by 24 per cent in the a.m. peak hour, by 21 per cent in the a.m. peak three hours, and by 4 per cent in the 12 hours from 6:30 a.m. to 6:30 p.m. These declines reflect steady reductions in the average number of people carried in each automobile over the 15-year period.

About one-third of commuting trips crossing the Metro boundary are destined to the Central Area and the other two-thirds to the remainder of Metropolitan Toronto. There is, in particular, a strong pressure for automobile commuting to the Central Area, both from Peel and Halton in the west and from Durham in the east, and these trips rely heavily on the Queen Elizabeth Way/Gardiner Expressway from the west and the Don Valley Parkway from the east and northeast. GO Transit serves the same commuter market and, as noted elsewhere in this report, has expanded its capacity and service levels greatly during the past two decades, capturing an increasing share of the market as its service has improved and that offered by increasingly congested roads has diminished.

4.5.3 Summary

In summary, therefore, the role of the Gardiner Expressway as a carrier of heavy trucks and as a commuter route is declining in both relative and absolute terms, due to a variety of factors. Among the most basic of these are the

economic forces and resulting land-use changes that have resulted in fewer heavy truck trips on the facility as heavy industry has moved to the suburbs. In addition, car occupancy levels have declined, peak-period operations on the Expressway have increasingly been limited by its capacity, and GO Transit patronage has expanded substantially. While pressures have grown for the Expressway's increased use as a commuting route and carrier of light trucks to serve the more intensive, specialized land uses in the Central Area as the area continues to evolve, increasingly the commuter traffic role is being taken over by GO Transit and related TTC services.

The impracticality — both in physical and in financial terms — of expanding road capacity into and through the Central Area has, during the same period, resulted in explicit City of Toronto, Metropolitan Toronto, and provincial policies to serve traffic growth by expanding transit rather than by building more roads. Reflecting this, a.m. peak-period auto trips entering the Central Waterfront by road (Queen Street to the waterfront, eastbound at Bathurst and westbound at the Don River from west and east combined) have been relatively static during the past 15 years while traffic carried by transit (in particular GO Transit) has increased by some 260 per cent. The proportion of a.m. peak-period person trips crossing these screenlines by road has declined from 65 per cent in 1975 to 50 per cent in 1990, and the drop in the a.m. peak hour has been from 59 per cent to 41 per cent over the same 15 years. While its role is still very significant, the Expressway's importance relative to that of GO Transit services has, therefore, declined during the past 15 years and, in light of public policy, will continue to do so over the coming decades.

Considering the Expressway's changing role, and recognizing its barrier impact — particularly in the central section between Jarvis and Bathurst streets — it can be argued that now is the time to examine the continuing role and existence of that section, in the context of greater intensification and specialization of land uses in the area, parallel development of a network of green open spaces and links, and the need to improve the environment.

The continuing importance of the Expressway for both goods and person movements must be borne strongly in mind, however, in considering whether the central section could be removed and, if so, under what circumstances. Even if discretionary use of autos in the area were to decline sufficiently, in line with the reduced road capacity, to keep congestion levels largely as they are today, removing the central link in the limited-access highway system in and through the Central Area would mean that east-west vehicular trips — in particular commercial truck, essential auto, and emergency vehicle trips — would be delayed further because of speed-limit reductions from 80 km/hr to 50 or 60 km/hr. In addition, the greater volume of east-west vehicular traffic on at-grade roads would create more conflict with north-south movements of pedestrians, bicyclists, and vehicles.



*"The challenge...is to
decide on an appropriate*

balance between ...

a better PLACE

... and maintaining

appropriate CORRIDOR

capacity and service levels."

"A key aspect of this

challenge is the role and

management of

automobile traffic."

4.6 THE CHALLENGE

It is clear that the Central Waterfront is in transition both as a **place** and as a **corridor**, a not altogether surprising fact, given the close interactions between land use and transportation. The challenge confronting the people of Greater Toronto and their elected and appointed representatives is to decide on an appropriate balance between the natural desire to achieve a better **place** in the course of redeveloping the area and also maintaining appropriate **corridor** capacity and service levels for transportation into and through the area.

Transportation requirements include the movement not only of people and goods in road and rail vehicles, but also of growing numbers of pedestrians and cyclists as, increasingly, the Central Waterfront becomes a place to live as well as one in which to work and play.

A key aspect of this challenge is the role and management of automobile traffic. It is clear that all or most of the growth in person travel to and from the Central Area will have to be carried by expanded transit services — that, indeed, has been the case for the past 15 years or longer. The central question is the extent to which substantially expanded and more attractive transit services, in conjunction with other transportation management measures, could attract a sufficient number of **additional** peak-period travellers to permit a reduction in road capacity — which would happen if the central section of the Expressway were removed — without unreasonable levels of vehicular congestion and delay.

If the answer to this question could be foreseen, and if the environmental, land-use, urban design, and economic benefits of such action were sufficiently high, a policy decision to **remove** the central section of the Expressway could be contemplated. If the risks of removal were seen to outweigh its benefits, similar assessments of the alternatives of **retaining** and ameliorating the Elevated Expressway, or **burying** it, would provide a basis for deciding on the most appropriate course of action. In order to address this challenge, a number of road system concepts for the Central Waterfront, covering different treatments of the elevated Expressway, were developed and assessed.

5

ROAD CONCEPTS FOR THE CENTRAL WATERFRONT



5: ROAD CONCEPTS FOR THE CENTRAL WATERFRONT

5.1 FAMILIES OF ROAD SYSTEM CONCEPTS

The Study Team examined three families of road system concepts to deal with the elevated Expressway:

1. **Retain** and ameliorate the effects of the elevated Expressway.
2. **Remove** the elevated Expressway and replace it with arterial roads and improved transit.
3. **Bury** the Expressway in a tunnel.

A fourth family of concepts, which involved retaining the Expressway at-grade instead of elevated, was rejected early in the study because of the severe problem of linking north-south roads over or under the Expressway while continuing to have normal intersections with other east-west roads in the Central Waterfront (e.g., Queen's Quay, Lake Shore Boulevard, Bremner Boulevard). Moreover, the related requirement east of Yonge Street that either the Expressway be moved southward with a significant environmental impact on the East Bayfront and adjacent shoreline or the railway corridor be depressed, was considered by the Royal Commission and the Study Team to be a major and disruptive undertaking, beyond the terms of reference of this study. The proposal of a Toronto architect that a linear park be constructed on top of an at-grade Gardiner Expressway was not carried forward for more detailed study because of similar problems if it were applied across the entire Central Waterfront (although his approach may have merit at specific locations).

Within each of the three remaining families, three illustrative road system concepts were developed and analysed, so that a total of nine such concepts were assessed. These are described in detail and with accompanying maps in the technical report. An outline description is provided in the following sections, including maps of a representative concept from each of the three families.

In addition to the Base Case (the existing Gardiner Expressway and road system with no changes), the nine illustrative road system concepts studied are as follows:

5.2 CONCEPTS IN WHICH THE ELEVATED EXPRESSWAY IS RETAINED

Family 1: Retaining the Gardiner Expressway Viaduct from Exhibition Place in the west to the Don River (and beyond) in the east.

- 1a. This concept is the Base Case plus the Front Street extension and widening of the Gardiner Expressway by two lanes between the Front Street extension and the Humber River bridge crossings. In addition, Bremner Boulevard would be extended west to Strachan Avenue and east to Bay Street, and both Simcoe Street and Portland Street would be extended south to Queens Quay.

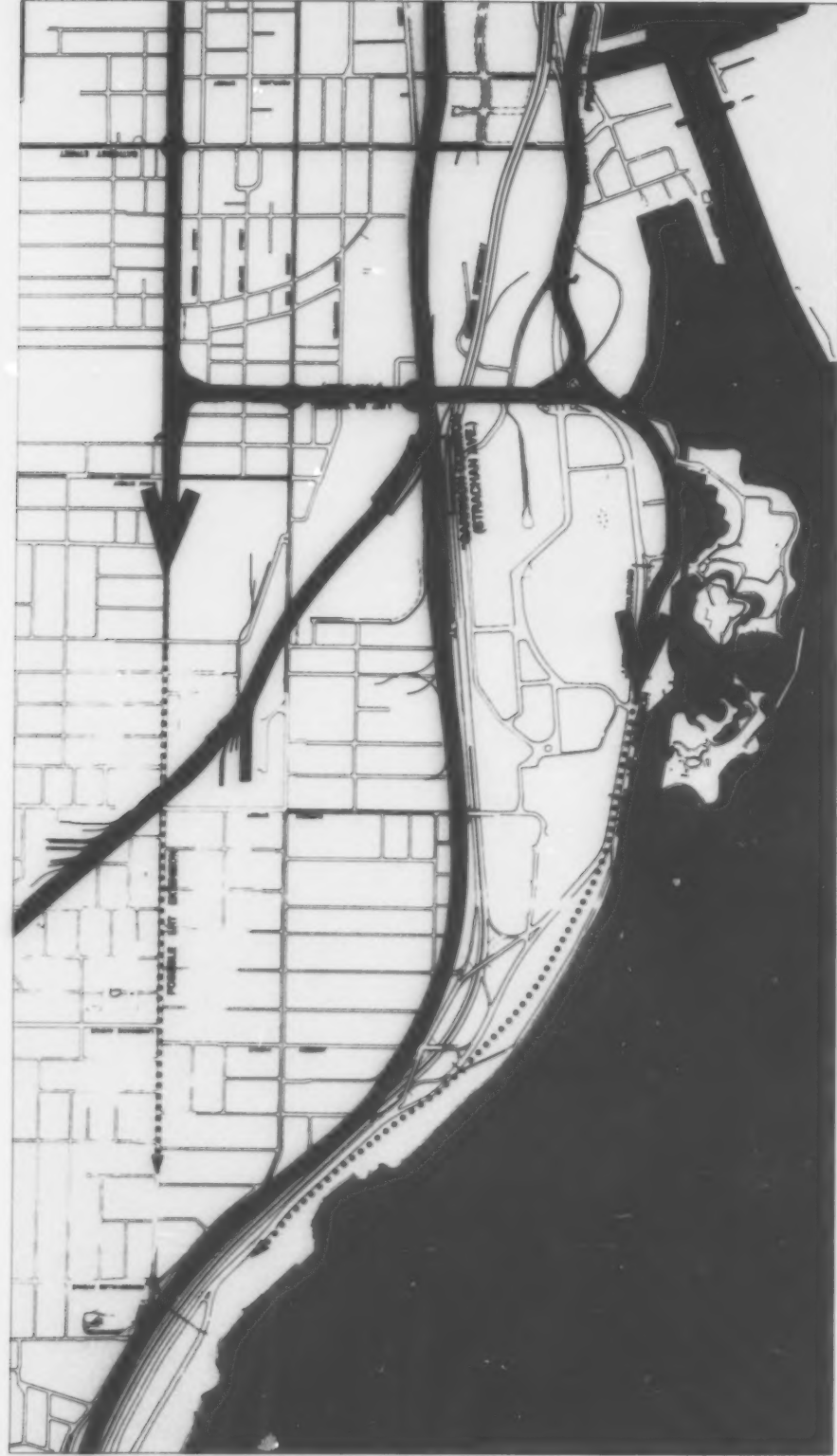
- 1b. This concept is similar to 1a, but would also involve removing Lake Shore Boulevard from beneath the Gardiner Expressway viaduct, as well as other changes. As illustrated in Exhibit 22, the concept includes:
- construction of the Front Street extension and widening of the Gardiner Expressway from Front Street around Humber Bay to the Humber River including construction of the new Humber River Bridge crossings;
 - westward extension of Bremner Boulevard in an alignment just south of the Expressway from Spadina Avenue along the north edge of Exhibition Place to connect with Lake Shore Boulevard west of Dufferin Street;
 - eastward extension of Bremner Boulevard from John Street to a connection with the Expressway east of Yonge Street;
 - widening to two lanes the ramps linking the Richmond-Adelaide one-way pair to the Don Valley Parkway;
 - downgrading of Lake Shore Boulevard from six lanes to four east of the point at which it intersects Bremner Boulevard west of Dufferin Street;
 - a new connection from Lake Shore Boulevard to Queen's Quay between Portland Street and Spadina Avenue, with completion of a continuous four-lane waterfront drive by means of another new connection from Queen's Quay just west of Parliament Street to Commissioners Street at Cherry Street; and
 - linking of the Expressway to Lake Shore Boulevard in the vicinity of Saulters Street (east of the Don Roadway), removal of the elevated Expressway east of that point, and downgrading of Lake Shore Boulevard to provide local access only, between Saulters and Cherry Streets.

The continuity of north-south streets would be increased by extending Simcoe and Portland streets south to Queen's Quay and Dufferin Street south to Lake Shore Boulevard. Simcoe (extended) and York streets would be a southbound-northbound one-way couplet connecting to Bremner Boulevard, the Expressway (to and from the west), Harbour Street, and Queen's Quay. In addition, Harbour Street would be extended from Yonge eastward to Jarvis Street if this could be achieved in connection with redevelopment of the affected properties. Harbour Street would continue to function as a distributor road for eastbound vehicles wishing to move from the Expressway to destinations in the Central Area, and would serve, in particular, left-turn movements northward onto York, Bay, Yonge, and Jarvis streets. A similar distributor role for westbound traffic from the Expressway, in particular between Jarvis and York streets, would be played by the eastward extension of Bremner Boulevard. These arrangements would allow Lake Shore Boulevard to be removed from beneath the Expressway between Portland and Yonge streets, thereby reducing considerably the barrier effect of the combined Gardiner Expressway/Lake Shore Boulevard.

EXHIBIT 21

POSSIBLE TRANSIT CONCEPTS

Key elements are expanded GO Transit including shoulder stations at Garrison Common and Ataratiri, a high quality LRT loop system serving the Central Waterfront, and possible subway improvements.



LEGEND	
	GO Transit
	Existing Light Rail Transit (LRT)
	Proposed LRT
	Existing Subway
	Possible Subway

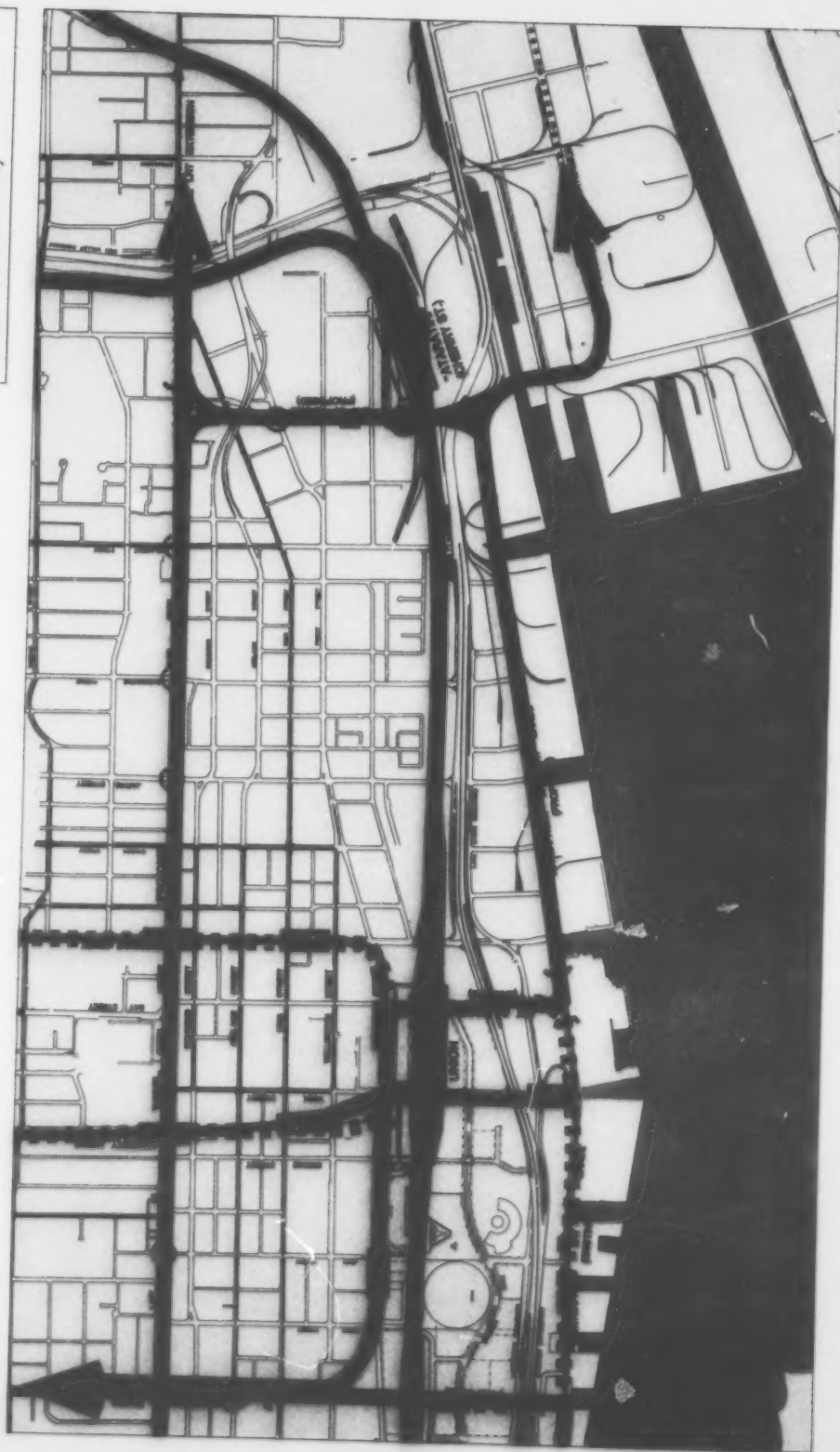
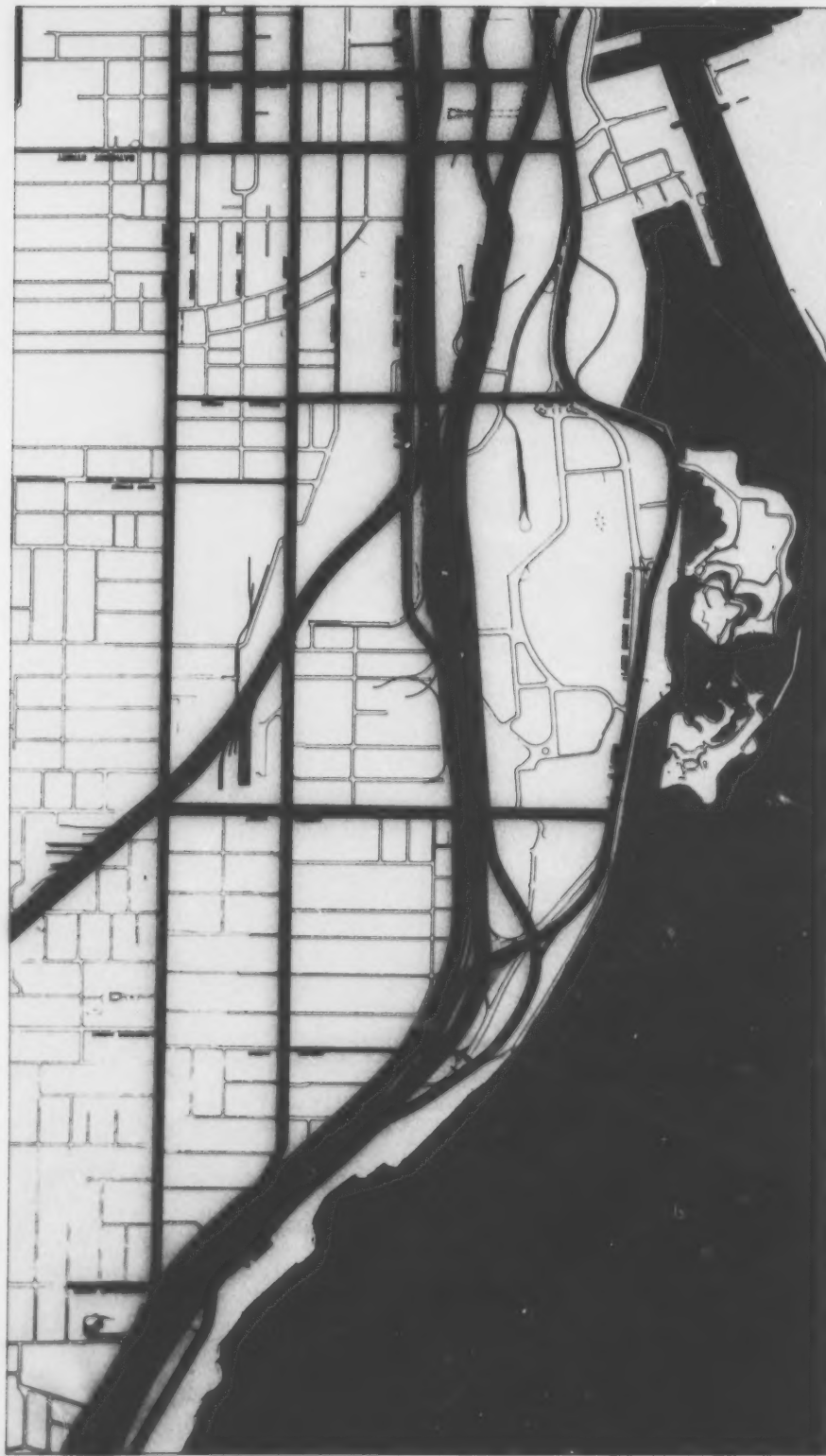


EXHIBIT 22

ILLUSTRATIVE ROAD SYSTEM - CONCEPT 1B

Retain elevated Expressway and move Lake Shore Boulevard out from under it between Portland Street and Yonge Street.



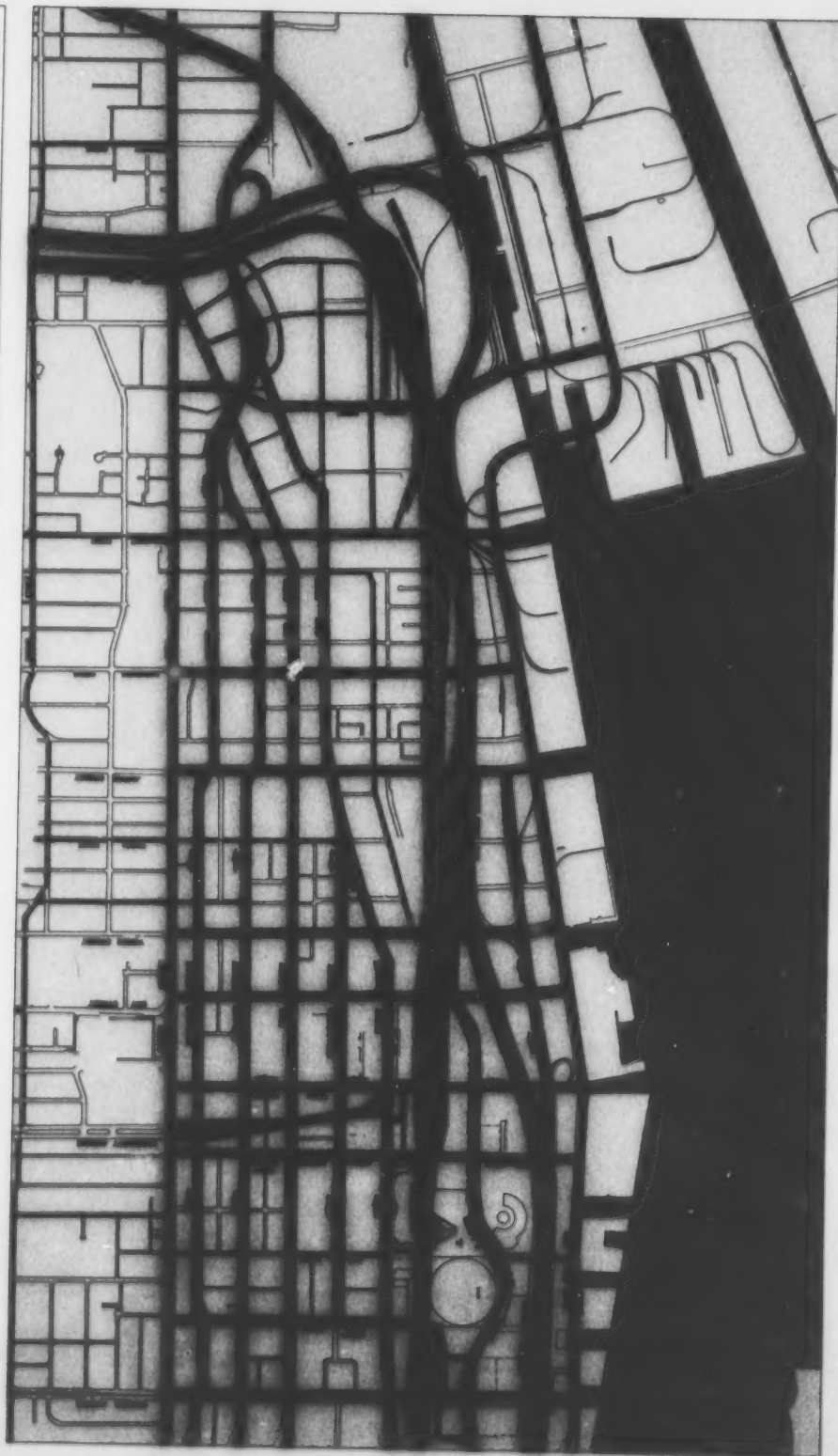
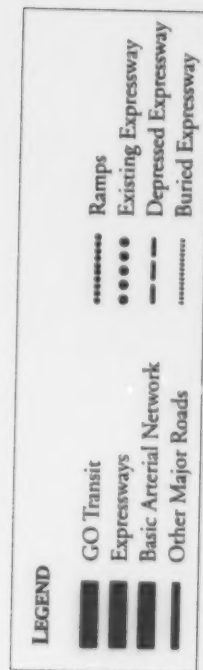


EXHIBIT 23

ILLUSTRATIVE ROAD SYSTEM - CONCEPT 2C
*Replace elevated Expressway from east of
Strachan Avenue to east of Cherry Street with
arterial roads.*



LEGEND	
	GO Transit
	Expressways
	Basic Arterial Network
	Other Major Roads
	Ramps
	Existing Expressway
	Depressed Expressway
	Buried Expressway

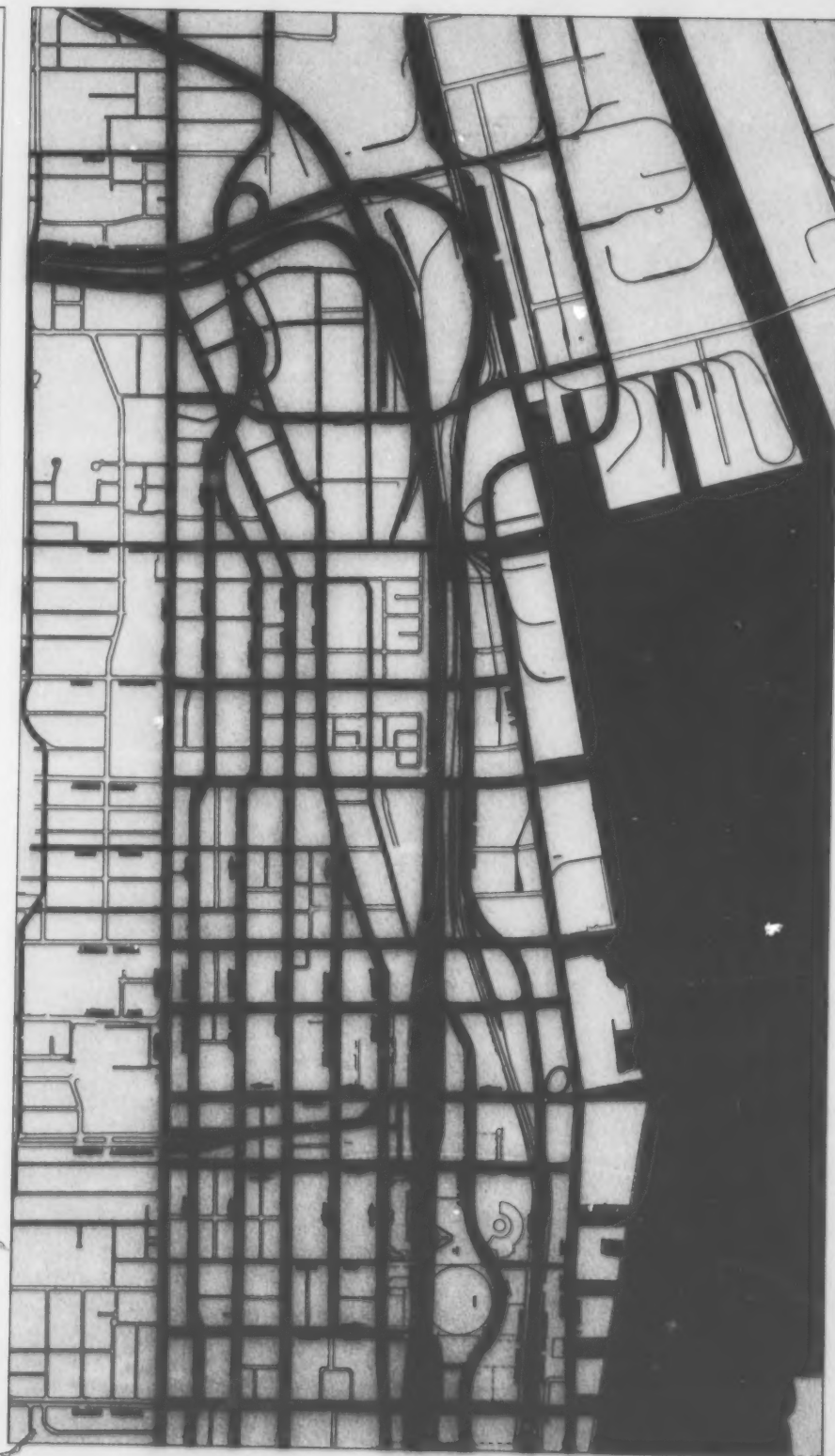
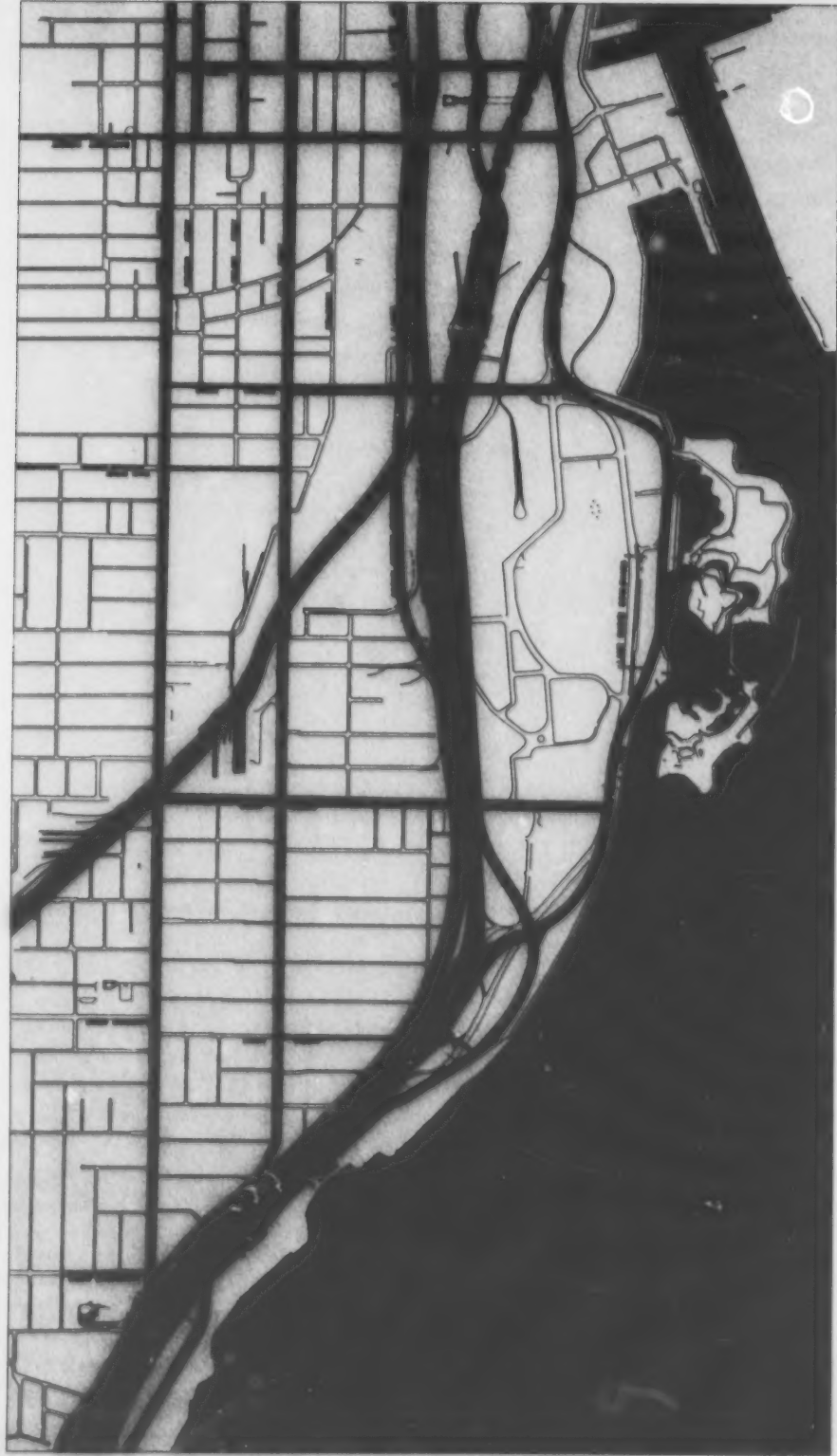
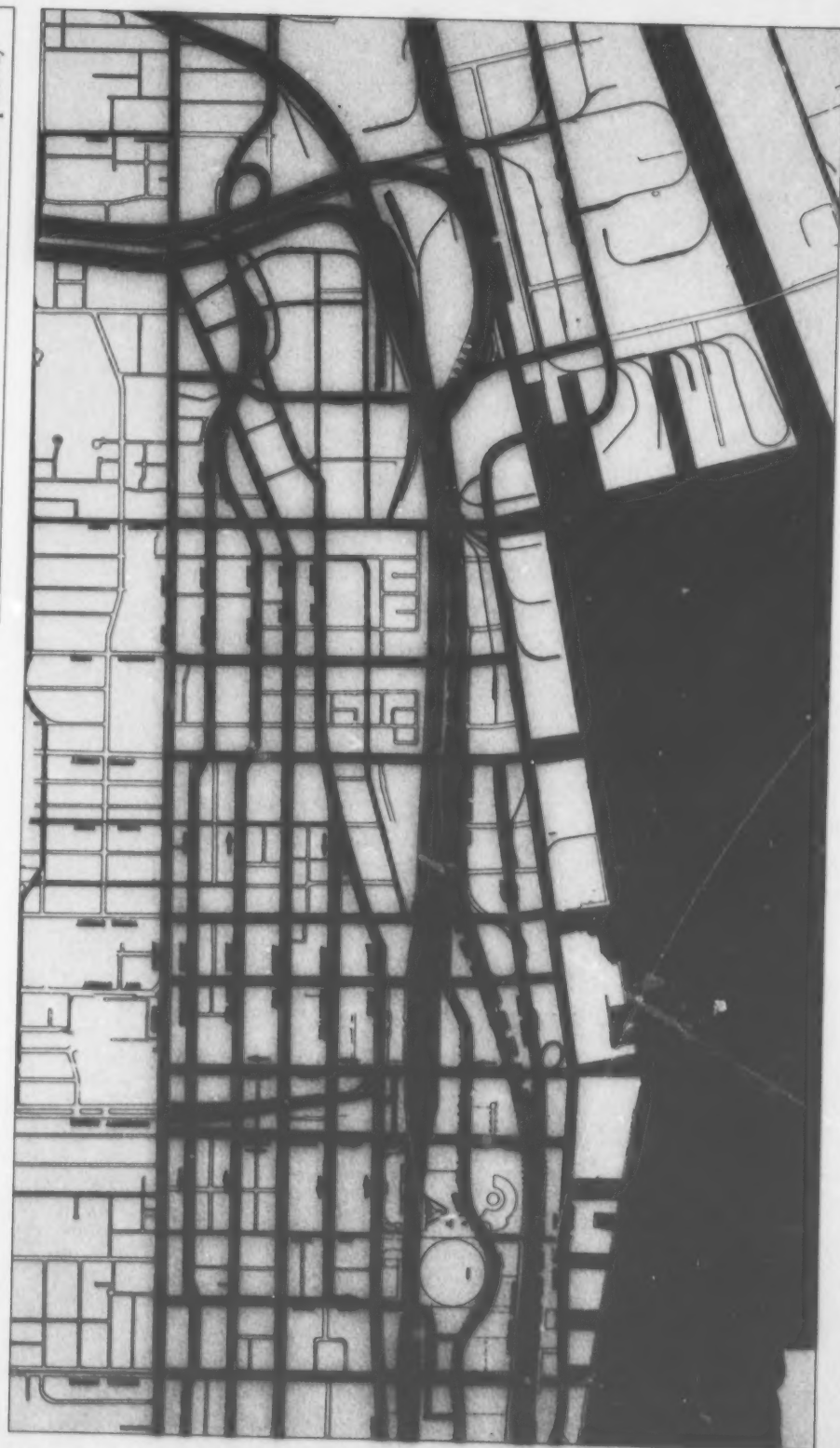
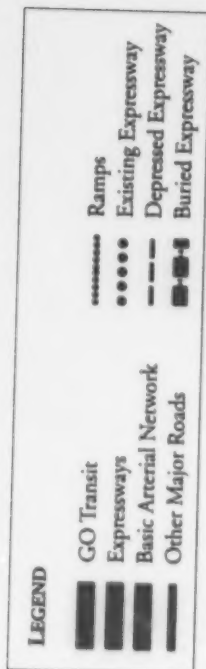


EXHIBIT 24

ILLUSTRATIVE ROAD SYSTEM - CONCEPT 3B

Bury the expressway in a tunnel from west of Strachan Avenue to east of Parliament Street along or close to the present alignment.





- 1c. This concept achieves compatibility with the Garrison Common Master Plan by extending Bremner Boulevard westward only as far as Strachan Avenue. Other changes are similar to those in 1b, including removing Lake Shore Boulevard from beneath the Gardiner Expressway viaduct, but the Front Street extension would be linked to Lake Shore Boulevard rather than to the Expressway (as is the case in all other road concepts studied).

5.3 CONCEPTS IN WHICH THE ELEVATED EXPRESSWAY IS REMOVED

Family 2: Removing the Gardiner Expressway Viaduct from the vicinity of Bathurst Street in the west to the vicinity of Cherry Street in the east (without replacing the "expressway function" in the corridor).

- 2a. In this concept, the Expressway would be depressed as it passes north of Exhibition Place, would pass beneath Strachan Avenue, and would be replaced by a one-way arterial couplet, from west of Bathurst Street to west of Cherry Street. Bremner Boulevard would be the westbound road in the concept and a new road, largely in or close to the alignment of the Expressway and Harbour Street, would serve as the eastbound road. Other changes would be similar to those in Concept 1b, except that the Expressway would not be widened around Humber Bay, Queen's Quay would be relocated southward between Jarvis and Cherry Streets to allow room for the eastbound part of the new one-way couplet, and the Front Street extension would be six instead of four lanes to help offload traffic from the Expressway.
- 2b. This concept would provide an expanded Lake Shore Boulevard with through-lane underpasses at four key north-south arterials (Bathurst, Spadina, York, and Jarvis) in place of the Expressway from west of Bathurst to west of Cherry. Bremner Boulevard would be extended westward only as far as Strachan Avenue. Other changes would be largely as in 2a, except that Queen's Quay would not be relocated southward between Jarvis and Cherry streets, and the elevated section of the Expressway east of the Don Valley Parkway would be removed.
- 2c. In this concept, the Expressway would also pass beneath Strachan Avenue and would be replaced by a six-lane arterial road from east of Strachan to east of Cherry Street. Bremner Boulevard would be extended westward only as far as Bathurst Street and would be extended eastward as far as Bay Street. Other changes would be largely as in Concept 2a, except that Lake Shore Boulevard would be a four-lane road on a more northerly alignment through Exhibition Place so that the park area to the south could be more closely integrated with Ontario Place, as shown in Exhibit 23.

5.4 CONCEPTS IN WHICH THE EXPRESSWAY IS BURIED

FAMILY 3: BURYING ALL OR PART OF THE GARDINER EXPRESSWAY.

- 3a. This concept would place the Expressway in a short tunnel from west of Strachan Avenue to just east of Portland Street. From that point eastward it would climb to its present elevation and be retained. Other changes would be largely as described for Concept 1b.
- 3b. This involves a long tunnel, on or close to the existing Expressway alignment, from west of Strachan Avenue to east of Parliament Street. From that point eastward the Expressway would climb and be retained as the existing elevated structure, including the elevated ramps connecting to the Don Valley Parkway and the elevated section eastward to Saulter Street. All other changes to the arterial road network would be essentially as described for Concept 1b, with the basic difference that the various ramps to and from the arterial network would be to an expressway in a tunnel rather than to an elevated expressway. The Expressway tunnel would have to pass under the Bay Street LRT tunnel or the latter would have to be deepened or truncated. Concept 3b is illustrated in Exhibit 24.



- 3c. This concept involves a somewhat longer tunnel, extending from Jameson Avenue in the west on an alignment under new fill just south of the existing harbour shoreline, to east of the Don River where it would emerge to link with the Don Valley Parkway. The existing elevated Expressway would be retained between Cherry and Leslie streets. Lake Shore Boulevard would be retained as a six-lane road on its existing alignment between Jameson Avenue on the west and Cherry Street on the east, where it would link to the elevated Expressway. Bremner Boulevard would be extended westward only as far as Bathurst Street and eastward as far as Bay Street. The tunnel would have interchanges at Spadina Avenue, York Street, and Jarvis Street, with ramps connected to southward extensions of those streets to enable traffic to and from the tunnel to cross Queen's Quay at-grade. Simcoe and York streets would not be operated as a one-way pair south of Front Street because the Expressway interchange would allow a direct connection only to York Street.

5.5 ANALYSIS AND SCREENING

The concepts were subjected to a corridor capacity analysis, in relation to existing automotive traffic demand levels, as described in the technical report and its Appendix D. The results of this analysis were used as input to the assessment of alternative road concepts.



6

ASSESSMENT OF ROAD SYSTEM CONCEPTS



6: ASSESSMENT OF ROAD SYSTEM CONCEPTS

6.1 CRITERIA

A detailed assessment of the nine road system concepts was carried out in terms of four major criteria:

1. land-use/urban design implications;
2. environmental implications;
3. transportation implications;
4. economic and financial implications.

Each criterion was expressed in terms of a number of factors and a larger number of measures, as illustrated in Exhibits 25-29. In total, the four criteria were expressed in terms of 23 factors and some 85 measures.

6.2 ASSESSMENT PROCESS

Four half-day workshops were held in late August, 1991 during which members of the Work Group and Study Team, as well as some members of the Steering Committee, conducted a systematic assessment of the nine road concepts, addressing each criterion individually. These were followed by two more half-day workshops in September, during which the same group synthesized the assessment across all four criteria and drew conclusions regarding the major trade-offs among the concepts and their implications for decision-making and possible program initiatives.

Exhibits 25-29 summarize the assessment results, in both written and symbolic terms, using clock faces to show how each set of road system concepts compares with the Base Case (the existing road system and Expressway with no change), which is given a neutral rating (six o'clock on the dial) for each of the four criteria and their various factors. The greater the amount of black showing on the clock dial, the higher the rating. The assessment is described more fully in the technical report and its Appendix E.

6.3 COMPARISONS AND TRADE-OFFS

A broad summary of the assessment follows; additional details are shown in Exhibits 25-29.

6.3.1 Land Use/Urban Design (Exhibit 28)

- If the Expressway were removed, the quality of the Central Waterfront as a place could be substantially improved — in terms of built form, green roads and links, street frontages, pedestrian-friendly streets, visual

LAND USE/URBAN DESIGN ASSESSMENT FACTORS	ILLUSTRATIVE CONCEPT FAMILIES RELATED TO ELEVATED GARDINER EXPRESSWAY TREATMENTS			
	FAMILY 1: RETAIN		FAMILY 2: REMOVE	
1.1 Civic Aesthetic Views and outlooks by motorists, transit riders, and pedestrians/cyclists.	1a	1b	2a	2b
	- Best from east and west for drivers. - Poor north-south views for pedestrians, cyclists and surface transit riders. - G&O Transit riders have good lake views around Hunter Bay, obstructed by elevated Expressway for those arriving from the east.	- Driver views from elevated Expressway are best but still significant around Hunter Bay and good from the Don River "ramp" ramps. - Much improved north-south views for pedestrians, cyclists, and surface transit riders. Improved lake views for G&O Transit riders, particularly from the east. Superior foreground views for all in the Central Waterfront, including drivers.	- Driver views from elevated Expressway are best but still significant around Hunter Bay and good from the Don River "ramp" ramps. - Much improved north-south views for pedestrians, cyclists, and surface transit riders. Improved lake views for G&O Transit riders, particularly from the east. Superior foreground views for all in the Central Waterfront, including drivers.	- Driver views from elevated Expressway are best but still significant around Hunter Bay and good from the Don River "ramp" ramps. - Much improved north-south views for pedestrians, cyclists, and surface transit riders. Improved lake views for G&O Transit riders, particularly from the east. Superior foreground views for all in the Central Waterfront, including drivers.
1.2 Legibility of Road Network and Block/Urbane Street Pattern, continuity and redundancy; sidewalk continuity, visual continuity along streets and other open spaces.	3a	3b	4a	4b
	- Improved urban street pattern, continuity, redundancy and sidewalk continuity for 3a. - Reduced legibility for 3b and 3c because many drivers would have to use the long tunnels.	- Improved urban street pattern, continuity, redundancy and sidewalk continuity for 3a. - Reduced legibility for 3b and 3c because many drivers would have to use the long tunnels.	- Improved urban street pattern, continuity, redundancy and sidewalk continuity for 3a. - Reduced legibility for 3b and 3c because many drivers would have to use the long tunnels.	- Improved urban street pattern, continuity, redundancy and sidewalk continuity for 3a. - Reduced legibility for 3b and 3c because many drivers would have to use the long tunnels.
1.3 Livability: Quality as a Place including residential environment, pedestrian-friendly streets, sidewalks and public spaces, and use of land, transit and multi-use, with ways and means for pedestrians/cyclists, continuity of street-front activity, vehicular traffic moving at urban speeds, ease of mid-block crossings.	5a	5b	6a	6b
	- Housing environment, pedestrian friendly streets, sidewalks, public spaces, continuity of street-front activity, etc. through urban streets and removal of elevated Expressway. - Similar levels of pedestrian/cyclist safety as in Family 1 with some added opportunities possible because of more urban street network and traffic speeds.	- Housing environment, pedestrian friendly streets, sidewalks, public spaces, continuity of street-front activity, etc. through urban streets and removal of elevated Expressway. - Similar levels of pedestrian/cyclist safety as in Family 1 with some added opportunities possible because of more urban street network and traffic speeds.	- Housing environment, pedestrian friendly streets, sidewalks, public spaces, continuity of street-front activity, etc. through urban streets and removal of elevated Expressway. - Similar levels of pedestrian/cyclist safety as in Family 1 with some added opportunities possible because of more urban street network and traffic speeds.	- Housing environment, pedestrian friendly streets, sidewalks, public spaces, continuity of street-front activity, etc. through urban streets and removal of elevated Expressway. - Similar levels of pedestrian/cyclist safety as in Family 1 with some added opportunities possible because of more urban street network and traffic speeds.
1.4 Walkability: Land Access/Linkages including regional/local transit service, truck/taxi loading/unloading convenience, additional developable land created, new street frontage/addresses available.	7a	7b	8a	8b
	- Somewhat higher level of regional/local transit service required/available than in Family 1. - Greater truck/taxi loading convenience owing to denser street pattern but slower average speeds likely in longer peak periods, in the absence of effective auto disincentives. - Family 2 provides greatest opportunities for increased developable land and street frontage/addresses, especially 2c.	- Somewhat higher level of regional/local transit service required/available than in Family 1. - Greater truck/taxi loading convenience owing to denser street pattern but slower average speeds likely in longer peak periods, in the absence of effective auto disincentives. - Family 2 provides greatest opportunities for increased developable land and street frontage/addresses, especially 2c.	- Somewhat higher level of regional/local transit service required/available than in Family 1. - Greater truck/taxi loading convenience owing to denser street pattern but slower average speeds likely in longer peak periods, in the absence of effective auto disincentives. - Family 2 provides greatest opportunities for increased developable land and street frontage/addresses, especially 2c.	- Somewhat higher level of regional/local transit service required/available than in Family 1. - Greater truck/taxi loading convenience owing to denser street pattern but slower average speeds likely in longer peak periods, in the absence of effective auto disincentives. - Family 2 provides greatest opportunities for increased developable land and street frontage/addresses, especially 2c.
1.5 Parks, Open Space, and Green Links including waterfront and riverbank paths and trails, positive open space, major and local parks, green links among parks, and pedestrian/cyclist accessibility to the lakefront, rivers and parks, and related outdoor amenities.	9a	9b	10a	10b
	Similar opportunities for improved parks, open space, green links, and pedestrian/cyclist access because Expressway is removed and more north-south and east-west streets, green links, and trails can be effectively provided.	Similar opportunities for improved parks, open space, green links, and pedestrian/cyclist access because Expressway is removed and more north-south and east-west streets, green links, and trails can be effectively provided.	Similar opportunities for improved parks, open space, green links, and pedestrian/cyclist access because Expressway is removed and more north-south and east-west streets, green links, and trails can be effectively provided.	Similar opportunities for improved parks, open space, green links, and pedestrian/cyclist access because Expressway is removed and more north-south and east-west streets, green links, and trails can be effectively provided.
Average Rating (unweighted)	11	12	13	14

LEGEND: MAJOR FEATURES OF THE THREE ROAD SYSTEM CONCEPTS SELECTED TO ILLUSTRATE EACH FAMILY

FAMILY 1: RETAIN

FAMILY 2: REMOVE

FAMILY 3: BURY

1a: Front St. Extension (FSE) built and Expressway widened from 10 to 12 lanes.

1b: As in 1a plus moving Lake Shore Blvd. from under Expressway to existing Bloor St. West through CNE, creating 4 lanes.

1c: As in 1b but Bloor St. West ramp at Prince's Lane.

2a: Replace Expressway with 1 way pair of streets, plus other changes.

2b: Replace Expressway with an 8 lane arterial with urban underpasses at four key intersections, plus other changes.

2c: Replace Expressway with 6 lane arterial, plus other changes.

3a: Front St. Extension (FSE) built and Expressway widened from 10 to 12 lanes.

3b: As in 1a plus moving Lake Shore Blvd. from under Expressway to existing Bloor St. West through CNE, creating 4 lanes.

3c: As in 1b but Bloor St. West ramp at Prince's Lane.

4a: Front St. Extension (FSE) built and Expressway widened from 10 to 12 lanes.

4b: As in 1a plus moving Lake Shore Blvd. from under Expressway to existing Bloor St. West through CNE, creating 4 lanes.

4c: As in 1b but Bloor St. West ramp at Prince's Lane.

5a: Front St. Extension (FSE) built and Expressway widened from 10 to 12 lanes.

5b: As in 1a plus moving Lake Shore Blvd. from under Expressway to existing Bloor St. West through CNE, creating 4 lanes.

5c: As in 1b but Bloor St. West ramp at Prince's Lane.

6a: Front St. Extension (FSE) built and Expressway widened from 10 to 12 lanes.

6b: As in 1a plus moving Lake Shore Blvd. from under Expressway to existing Bloor St. West through CNE, creating 4 lanes.

6c: As in 1b but Bloor St. West ramp at Prince's Lane.

7a: Front St. Extension (FSE) built and Expressway widened from 10 to 12 lanes.

7b: As in 1a plus moving Lake Shore Blvd. from under Expressway to existing Bloor St. West through CNE, creating 4 lanes.

7c: As in 1b but Bloor St. West ramp at Prince's Lane.

8a: Front St. Extension (FSE) built and Expressway widened from 10 to 12 lanes.

8b: As in 1a plus moving Lake Shore Blvd. from under Expressway to existing Bloor St. West through CNE, creating 4 lanes.

8c: As in 1b but Bloor St. West ramp at Prince's Lane.

9a: Front St. Extension (FSE) built and Expressway widened from 10 to 12 lanes.

9b: As in 1a plus moving Lake Shore Blvd. from under Expressway to existing Bloor St. West through CNE, creating 4 lanes.

9c: As in 1b but Bloor St. West ramp at Prince's Lane.

10a: Front St. Extension (FSE) built and Expressway widened from 10 to 12 lanes.

10b: As in 1a plus moving Lake Shore Blvd. from under Expressway to existing Bloor St. West through CNE, creating 4 lanes.

10c: As in 1b but Bloor St. West ramp at Prince's Lane.

11: Front St. Extension (FSE) built and Expressway widened from 10 to 12 lanes.

12: As in 1a plus moving Lake Shore Blvd. from under Expressway to existing Bloor St. West through CNE, creating 4 lanes.

13: As in 1b but Bloor St. West ramp at Prince's Lane.

14: Front St. Extension (FSE) built and Expressway widened from 10 to 12 lanes.

15: As in 1a plus moving Lake Shore Blvd. from under Expressway to existing Bloor St. West through CNE, creating 4 lanes.

16: As in 1b but Bloor St. West ramp at Prince's Lane.

links, and many other measures of livability and related amenities — over what is possible if the Expressway is **retained**. The quality of **place** could also be considerably improved if the Expressway were **retained** and its effects ameliorated but, because of the Expressway's overshadowing, visual intrusion, noise, vibration, and related negative effects, the prospect of improvement is not as great as if it were **removed**.

- The Study Team also concluded that the land-use and other benefits possible in the **long tunnel** concepts would not justify the very substantial additional capital costs relative to the equivalent or better land-use/urban design improvements that could be realized if the elevated Expressway were **retained** or the substantially superior land-use/urban design benefits that could be achieved if the elevated Expressway were **removed**. The group therefore concluded that the long tunnel concepts should be dropped from further consideration, which should concentrate on the relative strengths and weaknesses of **retaining** the Expressway versus **removing** it. However, the **short tunnel** concept could be treated as a sub-option and combined either with **retaining** the elevated Expressway (as in Concept 3a) or **removing** it in the central section east of the tunnel.

6.3.2 Environment (Exhibit 26)

- **Removing** the Expressway received a higher environmental rating than either of the other two sets of concepts, mainly because it involves fewer overshadowing and fall-out effects (e.g., dust and salt spray), as well as lower traffic levels and speeds, which would provide improved habitat and open space network opportunities. The **tunnel** concepts would also provide such opportunities, although to a lesser extent, mainly because they would require large ramps at Spadina Avenue and York and Jarvis streets. The long tunnel under the shoreline was given a lower rating because of its negative impact on the shoreline environment and the impact of traffic ramps along the shoreline, as well as increased north-south traffic levels crossing Queen's Quay.
- Equal vehicular emission ratings among the three sets of concepts masked two opposing trends: emissions increase in proportion to increased vehicle-kilometres of travel, but slower speeds also increase emissions per vehicle-kilometre and the effects tend to cancel each other out in the **remove** concepts. That is, while the concepts that would **remove** the Expressway would tend to reduce the overall level of vehicle-kilometres, they would also tend to reduce average vehicle speeds, and so would produce estimated future emission levels similar to those for the other two sets of concepts. This would be the case unless the land-use, housing, transit, and road programs described later, possibly combined with other transportation management measures including parking supply and pricing in the Central Area, effectively reduced vehicular volumes in line with changes in road capacity.

ENVIRONMENTAL ASSESSMENT FACTORS	ILLUSTRATIVE CONCEPT FAMILIES RELATED TO ELEVATED GARDINER EXPRESSWAY TREATMENTS					
	FAMILY 1: RETAIN			FAMILY 2: REMOVE		
	1a	1b	1c	2a	2b	2c
2.1 Terrestrial and Aquatic Environment , including impact on shorelines and rivers and opportunities for protecting and enhancing terrestrial habitats, improved floodplain management, and creating a diverse and continuous open space network.	● 5 Essentially same as Base Case except 1a's higher traffic levels/impact not compensated for by improved open space opportunities which are offered by 1b and 1c.	● 6	● 6	● 8 Lower traffic levels and speeds in 2c, and (to a lesser extent) 2b, than in 2a, combine with removed Expressway overhanging and fall-out to produce improved habitat and open space network opportunities.	● 9	● 10
2.2 Vehicular Emissions : including impact of reduced vehicle-km, impact of anticipated vehicle speed distributions, and local impact based on road elevations and traffic distribution.	● 6 Similar to Base Case.	● 6	● 6	● 6 Reduced vehicle-km would reduce total emissions but slower speeds increase emissions per vehicle-km and the effects tend to cancel each other out, unless demand abatement programs are effective.	● 6	● 6
2.3 Energy Consumption : Potential for reduced levels of transportation energy consumption.	● 6 Similar to Base Case.	● 6	● 6	● 6 Reduced vehicle-km would reduce total energy consumption, but slower speeds increase energy consumption per vehicle-km and the effects tend to cancel each other out.	● 6	● 6
2.4 Noise, Vibration, and Dust : Opportunities for reduced impact on adjacent areas from transportation uses.	● 6 Essentially similar proportion of traffic elevated in Family 1 as in Base Case.	● 6	● 6	● 6 More traffic at grade than in Family 1 but moving at slower speeds.	● 6	● 6
2.5 Soil Quality : Opportunities to reduce the effects of soil contamination.	● 6 Less soil moved in Family 1 to build new roads, so less opportunity to treat contaminated soil.	● 6	● 6	● 7 New roads more extensive, so more soil moved and able to be treated.	● 7	● 7
2.6 Groundwater Quality : Opportunity for improved groundwater management.	● 6 No tunnel or open cut requiring ground water interception	● 6	● 6	● 6 Short open cut/tunnel section in 2a, 2b and 2c would require ground water interception, but relatively minor.	● 6	● 6
2.7 Solid Waste Management : Low requirements for disposal of excavated material.	● 6 Minor disposal requirements in 1b and 1c.	● 5	● 5	● 4 Major portion of elevated Expressway to be disposed of in 2a, 2b and 2c.	● 4	● 4
Average Rating (unweighted)	● 5.9	● 5.9	● 5.9	● 6.1	● 6.3	● 6.5

LEGEND: MAJOR FEATURES OF THE THREE ROAD SYSTEM CONCEPTS SELECTED TO ILLUSTRATE EACH FAMILY

THIRTEEN POINT ASSESSMENT SCALE
WORSE ← SAME AS BASE CASE → BETTER
1 2 3 4 5 6 7 8 9 10 11 12

FAMILY 1: RETAIN
1a: Front St. Extension (FSE) built and Expressway widened from FSE to Humboldt.
1b: As in 1a plus moving Lake Shore Blvd. from under Expressway, extending Burner Blvd. west through CNE, creating 4-lane continuous waterfront drive.
1c: As in 1b but Burner Blvd. stops at Princes' Gate.

FAMILY 2: REMOVE
2a: Replace Expressway with 1-way pair of arterial, plus other changes.
2b: Replace Expressway with an 8-lane arterial with urban underpasses at four key intersections, plus other changes.
2c: Replace Expressway with 6-lane arterial, plus other changes.

FAMILY 3: BURY
3a: Tunnel from Stochan to Portland, plus other changes like 1b.
3b: Tunnel from Strickland to Cherry, plus other changes like 1b.
3c: Tunnel from Jamieson to Cherry, plus other changes like 1b.

EXHIBIT 27 TRADE-OFFS FOR CRITERION 3: TRANSPORTATION

TRANSPORTATION ASSESSMENT FACTORS	BASE CASE	ILLUSTRATIVE CONCEPT FAMILIES RELATED TO ELEVATED GARDINER EXPRESSWAY TREATMENTS								
		FAMILY 1: RETAIN			FAMILY 2: REMOVE			FAMILY 3: BURY		
		1a	1b	1c	2a	2b	2c	3a	3b	3c
3.1 Geometric Feasibility and Functional Integrity: - No. of E-W routes from the West at Dufferin (and from the East at Don River). - No. of points of substandard Expressway to arterial transition. - No. of locations where downstream capacity is less than upstream.	6	7	8	3	4	2	9	9	9	5
	3 (3)	4 (3)	5 (4)	4 (4)	5 (4)	5 (4)	5 (4)	5 (4)	5 (4)	4 (4)
	5	2	0	0	2	2	2	0	0	4
	4	4	1	1	5	4	8	1	1	5
3.2 Road System Capacity and Operations: - Eastbound capacity W of Bathurst - Ratio of existing eastbound demand to capacity - Westbound capacity E of Jarvis - Ratio of existing westbound demand to capacity - Peak hour operational performance	6	8	7	3	2	1	8	8	8	8
	9800 vph	10800 vph	10600 vph	9700 vph	5800 vph	5600 vph	10600 vph	10600 vph	10600 vph	10600 vph
	0.94	0.85	0.87	0.95	1.31	1.59	1.64	0.87	0.87	0.87
	8700 vph	8700 vph	10300 vph	10300 vph	5400 vph	4800 vph	4500 vph	10300 vph	10300 vph	10300 vph
3.3 User Travel Times and Costs: - Travel time Lake Shore/Humber to Front/York - Travel time Lake Shore/Coxwell to Front/York - Travel time Lake Shore/Humber to Lake Shore/Coxwell - Estimated length of daily peak periods	6	7	6	3	3	2	7	7	7	5
	17.7 min	17.7 min	17.6 min	25.0 min	23.7 min	23.7 min	17.6 min	17.6 min	17.6 min	20.8 min
	17.1 min	17.1 min	17.9 min	23.3 min	23.3 min	25.7 min	17.9 min	17.9 min	17.9 min	25.2 min
	15.2 min	15.2 min	16.6 min	36.8 min	33.5 min	42.9 min	16.6 min	16.6 min	16.6 min	26.8 min
3.4 User Choice, Convenience, and Safety: - Diverse route choice and convenience - Number of intersections with substandard spacing - No. of substandard transition/crossing locations - Length of roads suitable for cycling - No. of intersections potentially hazardous for pedestrians - Suitability of E-W truck routes	6	7	8	5	4	4	7	7	7	4
	Adequate	Good	Good	Adequate	Adequate	Adequate	Adequate	Good	Good	Adequate
	23	23	11	36	44	29	11	11	11	26
	9	9	3	3	13	5	3	3	3	6
3.5 Accessibility and Connectivity: - Property access by vehicles - Emergency vehicle movements - Surface transit efficiency - Access to intercity transportation terminals - For goods/courier movements	6	7	8	6	5	6	7	7	7	5
	Adequate	Adequate	Good	Good	Good	Good	Good	Good	Good	Good
	Adequate	Good	Good	Adequate	Adequate	Adequate	Adequate	Good	Good	Adequate
	Adequate	Good	Good	Adequate	Adequate	Adequate	Good	Good	Good	Good
Average Rating/(unweighted)	6.0	7.2	8.0	7.2	4.0	3.6	3.0	7.6	7.8	5.4

THIRTEEN POINT ASSESSMENT SCALE

WORSE ← SAME AS BASE CASE → BETTER

0 1 2 3 4 5 6 7 8 9 10 11 12

LEGEND: MAJOR FEATURES OF THE THREE ROAD SYSTEM CONCEPTS SELECTED TO ILLUSTRATE EACH FAMILY

FAMILY 1: RETAIN

1a: Front St. Extension (FSE) built and Expressway widened from FSE to Humber.

1b: As in 1a plus moving Lake Shore Blvd. from under Expressway, extending Bremner Blvd. west through CNF, creating 4-lane continuous waterfront drive.

1c: As in 1b but Bremner Blvd. stops at Princess' Gate.

FAMILY 2: REMOVE

2a: Replace Expressway with 1-way pair of arterials, plus other changes.

2b: Replace Expressway with an 8-lane arterial with urban underpasses at four key intersections, plus other changes.

2c: Replace Expressway with 6-lane arterial, plus other changes.

FAMILY 3: BURY

3a: Tunnel from Strachan to Portland, plus other changes like 1b.

3b: Tunnel from Strachan to Cherry, plus other changes like 1b.

3c: Tunnel from Jamieson to Cherry, plus other changes like 1b.

6.3.3 Transportation (Exhibit 27)

- If the Expressway were removed, the estimated automotive traffic capacity in the Central Waterfront corridor would be significantly decreased, by as much as 33 to 45 per cent, depending on the road concept. The existing eastbound capacity just west of Bathurst Street in the Central Waterfront corridor (about 9,800 vehicles per hour) would be marginally increased to about 10,600 vehicles per hour under Concept 1b and each of the three tunnel concepts, but would be reduced to an estimated 7,000 vehicles per hour under Concept 2a; 5,800 vehicles per hour under Concept 2b; and 5,600 vehicles per hour under Concept 2c. Similar relative changes in capacity were estimated for westbound traffic entering the corridor from the east.
- These reductions would cause a significant decrease in traffic service levels and possibly in economic competitiveness unless removal were preceded by implementation of favourable land-use policies, substantial transit improvements, arterial road system improvements, and possibly other transportation demand management measures, accompanied by a monitored stabilization of peak-period automobile traffic volumes.

6.3.4 Economics and Finance (Exhibit 28)

- In terms of economics and finance, the concepts retaining the elevated Expressway would have the least economic risk because of the relatively small investment and the maintenance of, or slight increase in, auto/truck capacity provided. Removing the Expressway would have the highest risk of causing economic constraint — owing to increased road congestion — unless it were preceded by effective policies (e.g., land-use, transit, arterial road system improvements) but would also have the most potential for effective financial recovery and economic spin-offs if carried through as envisaged in this study.
- The financial feasibility of the various road concepts relates primarily to the estimated capital cost and the value of new land released, for each concept. Initial estimates for each are shown in Exhibit 28, along with an estimate of the capital cost less potential recapture of the value of new land released. The wide range of values reflects the considerable uncertainty in these estimates. Concept 2c would have potentially the lowest net capital cost (about \$160-\$480 million) followed by Concept 2a (\$230-\$730 million). Concept 1b has an estimated net capital cost in the range of \$390-\$650 million, while the net capital cost of the long tunnel options would be in the range of \$1,100-\$1,470 million. As indicated, the large front-end cost, long construction times, and delayed recapture revenues for the long tunnels are such that interest costs on the initial investment would tend to overwhelm

EXHIBIT 28 TRADE-OFFS FOR CRITERION 4: ECONOMICS/FINANCE

ECONOMICS/FINANCE ASSESSMENT FACTORS	ILLUSTRATIVE CONCEPT FAMILIES RELATED TO ELEVATED GARDINER EXPRESSWAY TREATMENTS									
	FAMILY 1: RETAIN			FAMILY 2: REMOVE			FAMILY 3: BURY			
	BASE CASE	1a	1b	1c	2a	2b	2c	3a	3b	3c
4.1 Public Transit Requirements: Additional public transit capacity required by 2021 in Central Waterfront relative to the Base Case.	0	0	0	0	0	0	0	0	0	0
4.2 Costs for Road Development: Range of capital cost for construction, property and soil cleanup.	\$150m	\$325-375m	\$510-654m	\$440-575m	\$427-729m	\$528-711m	\$314-482m	\$553-715m	\$1238-1421m	\$1318-1470m
4.3 Transportation, Operation and Maintenance Costs: - Annual Road O&M Costs - Private vehicle Operating Costs per day - Additional Net Transit Operations Costs per day	\$2.2m \$460-490k	\$2.4m \$510-620k -\$18k	\$2.3m \$490-600k -\$44k	\$2.3m \$480-580k +\$2k	\$2.1m \$410-500k +\$51k	\$2.2m \$410-500k +\$73k	\$2.0m \$380-460k +\$76k	\$2.3m \$500-600k -\$14k	\$2.3m \$500-600k -\$14k	\$2.5m \$530-640k -\$14k
4.4 Implementation Feasibility: - Project definition flexibility - Approval time - Disruption of Central Area traffic flows - Disruption to adjacent communities	0	0	0	0	0	0	0	0	0	0
4.5 Economic Impetus and Efficiency: - Daily truck operating costs - Value of new land released	\$157k	\$201-217k for the three concepts	\$201-217k for the three concepts	\$201-217k for the three concepts	\$201-217k for the three concepts	\$201-217k for the three concepts	\$201-217k for the three concepts	\$201-217k for the three concepts	\$201-217k for the three concepts	\$201-217k for the three concepts
Risk of longer peak periods/congestion	Neutral	Slightly lower for 1a and 1b	Slightly lower for 1a and 1b	Slightly lower for 1a and 1b	Slightly lower for 1a and 1b	Slightly lower for 1a and 1b	Slightly lower for 1a and 1b	Slightly lower for 1a and 1b	Slightly lower for 1a and 1b	Slightly lower for 1a and 1b
4.6 Financial Feasibility: - Road construction costs per unit of capacity added - Capital cost less potential recapture - Average annual investment over 10-year implementation time	\$150m \$15m	\$30.1k \$325-375m \$33-38m	\$48.2k \$385-654m \$39-65m	\$45.4 \$315-575m \$32-58m	\$61.3k \$227-729m \$23-73m	\$91.3k \$398-711m \$40-71m	\$56.1k \$159-482m \$16-48m	\$48.4k \$428-715m \$43-72m	\$120.2k \$1103-1421m \$113-147m	\$124.3k \$1128-1470m \$113-147m
Average Rating (unweighted)	6.0	5.5	5.3	5.2	5.2	4.8	5.2	5.0	3.5	3.5

LEGEND: MAJOR FEATURES OF THE THREE ROAD SYSTEM CONCEPTS SELECTED TO ILLUSTRATE EACH FAMILY									
FAMILY 1: RETAIN			FAMILY 2: REMOVE			FAMILY 3: BURY			
1a: Front St. Extension (FSE) built and Expressway widened from FSE to Humbler.	2a: Replace Expressway with 1-way pair of arterials, plus other changes.	3a: Tunnel from Strachan to Portland, plus other changes like 1b.	1b: As in 1a plus moving Lake Shore Blvd. from under Expressway, extending Bremner Blvd. west through CNL, creating 6-lane continuous waterfront drive.	2b: Replace Expressway with an 8-lane arterial with urban underpasses at four key intersections, plus other changes.	3b: Tunnel from Strachan to Cherry, plus other changes like 1b.	1c: As in 1b but Bremner Blvd. ramps at Princes' Gate.	2c: Replace Expressway with 6-lane arterial, plus other changes.	3c: Tunnel from Jamieson to Cherry, plus other changes like 1b.	

revenues from land value recaptured. The Base Case is also shown to have a capital cost of \$150 million — a capitalization of the ongoing annual rehabilitation costs currently budgeted to deal with structural deterioration of the elevated Expressway.

6.4 SUMMARY: OPPORTUNITIES AND RISKS (EXHIBIT 29)

It can be seen that considerable improvements in terms of both land use and transportation could be achieved while **retaining** the Expressway, and this is also true, to a somewhat lesser extent, of the long tunnel options. Both the **retain** and **bury** options would produce a slight continuing degradation of the environment. In contrast, the **remove** options would produce substantial opportunities for an improved **place**, particularly in terms of green infrastructure, built form, legibility of the street and block pattern, and livability of the area. The **remove** options would also produce improvements in the environment, reflecting an enhanced ability to realize a full system of open spaces and green links, plus related environmental quality improvements.

On the down side, however, the **remove** concepts would result in reduced automotive capacity in the corridor — by as much as 33 to 45 per cent, depending on the road concepts selected — and there would be a real risk that road traffic congestion and delays would rise to unreasonably higher levels if appropriate measures were not effectively in place before the Expressway section were removed.

Road concepts that would remove the central section of the Expressway therefore provide both the greatest opportunities for an improved **place** and the greatest risks of a diminished **corridor** function. Given the substantially higher costs and greater financial risk of the long tunnel options, and the fact that their benefits in terms of the other three criteria were not found to be as great as those for the **retain** options, the Study Team concluded that the long tunnels should be dropped from further consideration.

The **remove** options also have extreme characteristics in terms of the economic and finance criterion. On the one hand, the risk of traffic congestion and vehicular delays could lead to greater economic growth constraint due to loss of competitiveness. On the other hand, the superior built environment and attractiveness of the area as a **place** if the Expressway were removed are felt to be such that these concepts would provide a greater opportunity for economic development in the Central Area and for related economic spin-offs.

In short, the opportunities are greatest with the **remove** concepts, but these also pose risks that would not be incurred if the Expressway were **retained**.

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EXHIBIT 29 MAJOR ASSESSMENT TRADE-OFFS

ILLUSTRATIVE CONCEPT FAMILIES RELATED TO ELEVATED GARDINER EXPRESSWAY TREATMENTS						
CRITERIA	FAMILY 1: RETAIN			FAMILY 2: REMOVE		FAMILY 3: BURY
	Concepts: 1a	1b	1c	Concepts: 2a	2b	2c
Land Use/Urban Design	- Similar to existing situation but improvements possible if Lake Shore Boulevard moved out from under Expressway plus other arterial changes as in Concepts 1b and 1c. - Civic arrival best, for auto/truck users. - Some improvements to livability, land access, street linkages, and parks/green links are possible, particularly in concepts 1b and 1c.	- Great improvements possible in terms of quality as a place, legibility of road network and blocks, land access, north-south and east-west linkages and parks/green links, compatible with emerging land-use/urban design "visions" for the Central Waterfront. - Civic arrival panoramic views more restricted for auto/truck users but superior foreground experience for all becomes possible.	- Great improvements possible in terms of quality as a place, legibility of road network and blocks, land access, north-south and east-west linkages and parks/green links, compatible with emerging land-use/urban design "visions" for the Central Waterfront. - Civic arrival panoramic views more restricted for auto/truck users but superior foreground experience for all becomes possible.	- Great improvements possible in terms of quality as a place, legibility of road network and blocks, land access, north-south and east-west linkages and parks/green links, compatible with emerging land-use/urban design "visions" for the Central Waterfront. - Civic arrival panoramic views more restricted for auto/truck users but superior foreground experience for all becomes possible.	- Significant opportunity for improved parks/green connectors and quality of place, particularly in Concept 3b, but ramps are disruptive in Concept 3b and more so in Concept 3c. - Civic arrival for auto/truck users substantially worse than now, particularly for Concept 3c which involves the longest tunnel. - Reduced legibility of road network for Concepts 3b and 3c, but improved opportunities for linkages, and land access with arterial changes.	- Significant opportunity for improved parks/green connectors and quality of place, particularly in Concept 3b, but ramps are disruptive in Concept 3b and more so in Concept 3c. - Civic arrival for auto/truck users substantially worse than now, particularly for Concept 3c which involves the longest tunnel. - Reduced legibility of road network for Concepts 3b and 3c, but improved opportunities for linkages, and land access with arterial changes.
Environment	Limited opportunity for improved terrestrial environment and soil quality, but likely to be negated by the fallout from increased auto/truck traffic on elevated Expressway.	- Provides greatest opportunity for improved terrestrial and aquatic environment, compatible with emerging environmental concepts as embodied in Royal Commission findings/actions. - Air quality improvements from reduced vehicle-km could be negated by slower speeds, unless land use, transit, and road programs are effective; if programs are effective, this family of concepts would achieve most advantages in terms of improved environment.	- Provides greatest opportunity for improved terrestrial and aquatic environment, compatible with emerging environmental concepts as embodied in Royal Commission findings/actions. - Air quality improvements from reduced vehicle-km could be negated by slower speeds, unless land use, transit, and road programs are effective; if programs are effective, this family of concepts would achieve most advantages in terms of improved environment.	- Provides greatest opportunity for improved terrestrial and aquatic environment, compatible with emerging environmental concepts as embodied in Royal Commission findings/actions. - Air quality improvements from reduced vehicle-km could be negated by slower speeds, unless land use, transit, and road programs are effective; if programs are effective, this family of concepts would achieve most advantages in terms of improved environment.	- Provides greatest opportunity for improved terrestrial and aquatic environment, compatible with emerging environmental concepts as embodied in Royal Commission findings/actions. - Air quality improvements from reduced vehicle-km could be negated by slower speeds, unless land use, transit, and road programs are effective; if programs are effective, this family of concepts would achieve most advantages in terms of improved environment.	- Waterfront green areas created by Concept 3c would be degraded by substantial ramps. - Aquatic habitat disrupted by Concept 3c. - Disposal of excavated waste would be a problem particularly in Concepts 3b and 3c.
Transportation	- Improved auto/truck circulation. - Major transit improvements needed to handle demand growth. - Continuing congestion likely unless other auto use disincentives are effective.	- Slower auto/truck circulation. - Slightly greater transit improvements needed to handle demand growth, but small capital cost difference. - Substantially greater road congestion probable unless other demand abatement programs are effective.	- Slower auto/truck circulation. - Slightly greater transit improvements needed to handle demand growth, but small capital cost difference. - Substantially greater road congestion probable unless other demand abatement programs are effective.	- Slower auto/truck circulation. - Slightly greater transit improvements needed to handle demand growth, but small capital cost difference. - Substantially greater road congestion probable unless other demand abatement programs are effective.	- Slower auto/truck circulation. - Slightly greater transit improvements needed to handle demand growth, but small capital cost difference. - Substantially greater road congestion probable unless other demand abatement programs are effective.	Same as for Family 1 except Concept 3c (underwater tunnel) would have greatly increased north-south auto/truck traffic at and north of the shoreline plus other operations/safety problems.
Economic/Financial	- Net capital costs for Families 1 and 2 and Concept 3a in the same range. - Net operating/maintenance costs are similar for all Families but may be somewhat higher for Concepts 3b and 3c. - Family 1 has least economic risk because of relatively small investment and maintenance of, or slight increase in auto/truck capacity. - Also has least potential for effective financial recovery and economic spin-off.	- Has highest risk of causing economic constraint unless preceded by effective transit improvements, restructured land use and possibly auto disincentives. - Generally lower net investment than Family 1. - Most potential for effective financial recovery and economic spin-off.	- Has highest risk of causing economic constraint unless preceded by effective transit improvements, restructured land use and possibly auto disincentives. - Generally lower net investment than Family 1. - Most potential for effective financial recovery and economic spin-off.	- Has highest risk of causing economic constraint unless preceded by effective transit improvements, restructured land use and possibly auto disincentives. - Generally lower net investment than Family 1. - Most potential for effective financial recovery and economic spin-off.	- Has highest risk of causing economic constraint unless preceded by effective transit improvements, restructured land use and possibly auto disincentives. - Generally lower net investment than Family 1. - Most potential for effective financial recovery and economic spin-off.	Family 3 (Concepts 3b and 3c) has greatest risk of overinvestment in roads and tunnels if auto disincentives plus improved transit are successfully implemented.

THIRTEEN POINT ASSESSMENT SCALE



LEGEND: MAJOR FEATURES OF THE THREE ROAD SYSTEM CONCEPTS SELECTED TO ILLUSTRATE EACH FAMILY

FAMILY 1: RETAIN

- 1a: Front St. Extension (FSE) built and Expressway widened from FSE to Harbour.
- 1b: As in 1a plus moving Lake Shore Blvd. from under Expressway, crossing Burnham Blvd. west through CNE, creating 4-lane concrete road with traffic lights.
- 1c: As in 1b but Burnham Blvd. stops at Prince's Gate.

FAMILY 2: REMOVE

- 2a: Replace Expressway with 1-way pair of arterials, plus other changes.
- 2b: Replace Expressway with an 8-lane arterial with urban underpasses at four key intersections, plus other changes.
- 2c: Replace Expressway with 6-lane arterial, plus other changes.

FAMILY 3: BURY

- 3a: Tunnel from Strachan to Harbour, plus other changes like 1b.
- 3b: Tunnel from Strachan to Cherry, plus other changes like 1b.
- 3c: Tunnel from Junction to Cherry, plus other changes like 1b.

CONCLUSIONS



7: CONCLUSIONS

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community improvements."*

7.1 RECAPTURING THE WATERFRONT IS AN ACHIEVABLE GOAL

The almost complete transformation of the Central Waterfront — from largely industrial and rail freight activities 30 years ago to a mixture of residential, commercial, urban industrial, and recreational uses during the next two decades — provides us with a once-in-a-century opportunity to reunite the Central Waterfront with the rest of the city and also to create a place with cleaner air, water, and soil; substantially more green areas and links; a more livable, diverse set of mixed-use communities; expanded and improved transit service; a more legible and connected road system providing good access to local land parcels as well as accommodating longer trips; and economic opportunities for development and related spin-offs. The study results show that, to realize this goal, a number of important steps need to be taken, regardless of whether or not the elevated Expressway is retained or removed.

7.2 ECONOMIC PROSPERITY AND ENVIRONMENTAL IMPROVEMENT ARE THE BASES

Reflecting the interdependencies among the community, the economy, and the environment referred to earlier, the quality and viability of the Central Waterfront as both a place and a corridor require a firm economic and environmental base.

7.2.1 Economic Prosperity

Economic prosperity is necessary not only for survival but also to provide the means of achieving change. The economy is the engine of the community, and the Central Area of Greater Toronto is particularly significant in this regard, not only for Toronto but for the Province of Ontario and for Canada.

As described earlier, economic forces, including increased land prices and growing competition for transportation capacity in the Central Area, have resulted in the exodus of many industrial and rail activities from the centre to suburban locations and elsewhere, thereby freeing up hundreds of hectares of land in the Central Waterfront for other uses. Continuing economic prosperity in the Greater Toronto Area depends heavily on the nature and timing of the Central Waterfront's transformation into a vibrant community of residential, commercial, urban industrial, and recreational uses. If the mix of uses and quality of the result are inappropriate for the country's leading metropolis, or if implementation takes too long, economic opportunities will be lost and the region's competitive position harmed, thereby weakening the ability of governments and the private sector to enhance the environment and create a better community.

An agreed-on plan — involving environmental enhancement, a land-use concept, transit, roads, and other infrastructure — is required for the Central Waterfront and adjacent areas as the basis for countless economic decisions, not only by governments but by landowners, commercial and industrial enterprises, residents, workers, tourists, and many others. Together, these decisions can provide sufficient economic impetus to support the desired environmental and community improvements. The lack of a coherent and agreed-on plan has created ongoing uncertainty which, in turn, has delayed economic and development activities that might otherwise be under way by now. The economic challenge, therefore, is to reduce uncertainty by establishing the required plan and infrastructure, with due regard for the economic effectiveness of the plan and efficiency of the infrastructure.

The Greater Toronto Area Urban Structure Concepts Study published in 1990 demonstrated that the cost per unit of a new residential community on redeveloped central land is, in general, considerably less than that of a new residential community on farmland, not only in terms of the environment and land consumption, but in terms of the dollar costs for site preparation and required infrastructure (unless there are significant special site preparation costs such as for soil clean-up or flood control in the downtown location). The dollars saved through appropriate development of the Central Waterfront — in a time of chronic financial constraint — can be well employed to help create a better community and a healthier environment for all in the GTA and surrounding areas.

7.2.2 Environmental Quality

The facts that much of the land in the Central Waterfront has been cleared in preparation for redevelopment and a number of important infrastructure decisions have yet to be made provide the opportunity to create significantly improved environmental conditions there. If automotive volumes can be stabilized at existing or lower levels, improvements in fleet emission characteristics anticipated over the coming decades can be expected to reduce automotive emissions significantly in the Central Waterfront corridor. If automotive volumes can be stabilized or reduced without extreme increase in vehicular congestion — as might be possible if the Expressway were removed with appropriate programs in place beforehand — greater improvements in air quality could be achieved. Similar possibilities exist regarding reduced noise and vibration from high-speed vehicular traffic if the Expressway were removed, although increased levels of vehicular traffic congestion — if the prerequisite programs were not effectively in place — could negate these in terms of crowded roads and streetside levels of vehicular emissions.

Recent plans for a major interceptor sewer system along the waterfront and in the lower Don Valley hold the promise of significantly improved water quality due to more effective stormwater management and reduced outfalls of

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untreated sanitary sewage during major storms. Continuing redevelopment of the area provides the opportunity to remediate contaminated soils in a number of former industrial areas.

Equally important, an emerging concept of open space, parks, and green links can be put in place, providing a setting for important amenities such as the waterfront trail and access by pedestrians and bicyclists to the waterfront, heritage features, opportunities for improved terrestrial and aquatic habitats, better recreational activities, and an opportunity to improve the diversity and mix of places as well as microclimatic conditions.

It is essential that such an environmental action plan be established in advance of most of the redevelopment and infrastructure decisions, both in order to enhance and protect the natural environment and to make the area healthier and more attractive for residential, recreational, and other community uses.

7.3 CENTRAL WATERFRONT HOUSING IS THE CATALYST

As outlined earlier, in estimating demand growth between now and 2021, a range of land-use scenarios was tested. The least growth in travel demand to the centre results from scenarios with intensified residential development in the Central Area, as well as compact, nodal urban form in the Greater Toronto Area; the most growth would result from a continuation of past trends with modest increases in Central Area residential development and sustained low-density, auto-oriented development in the suburbs.

The magnitude of the range is very significant: for a.m. peak-hour trips from the west and east combined (crossing Bathurst Street and the lower Don respectively from Queen Street south), to 2021 it is about 32,000 person trips (an increase of 69 per cent relative to the 1986 peak-hour demand of 46,900 person trips) to about 64,000 person trips (an increase of 138 per cent).

There are many other reasons, in addition to reduced long-distance commuting, for favouring more balanced population and employment growth and compact, mixed-use communities throughout the Greater Toronto Area. As documented in the 1990 *Greater Toronto Area Urban Structure Concepts Study*, these include a more diverse and interesting urban fabric with a wider range of social and economic opportunities, many within walking distance; safer, more populated streets; a city designed for people that encourages transit use rather than generating more communities of auto-captives. As also documented in that study, substantial economic spin-offs would result and greatly reduced land consumption is achievable by delivering new housing units on redeveloped sites in existing urban areas rather than by creating new low-density subdivision housing on "greenfields" (rural) land, as noted in Exhibit 30.

The major land-use conclusion is therefore that intensive residential development in the Central Area, along with continuing growth of employment, is essential, and more compact, mixed-use, nodal development in the Greater Toronto Area is desirable, to help reduce growth pressures for long commuting trips to the Central Area via the Central Waterfront and, equally important, to encourage greater use of transit and create a richer urban experience in both central and suburban areas. This implies Central Area residential development over the next 30 years at a scale two or three times that proposed for the next ten years in *Cityplan '91*, with appropriate land-use changes.

7.4 EXPANDED TRANSIT IS THE WORKHORSE

Since 1975, transit has supplanted automobiles as the mode carrying the most people into the Central Waterfront from east and west combined during the a.m. peak hour and the a.m. peak period, and its role in carrying such trips throughout the day has also become more significant. These trends will continue over the coming decades, for reasons outlined below.

7.4.1 Significantly Expanded Auto Travel Is Not Feasible

From the west alone, meeting the estimated growth in peak-hour demand south of Queen Street solely by means of expanded auto travel would require an additional 8 to 19 freeway lanes, and from the west and east combined an additional 13 to 27 freeway lanes. Clearly, it would be out of the question to attempt such a road expansion plan. However, there is a much more modest potential to increase road capacity from the west and east in the Gardiner/Lake Shore Corridor, under plans currently being considered by Metropolitan Toronto, which would accommodate up to



ECONOMIC & ENVIRONMENTAL IMPACTS OF HOUSING PROGRAM

• 3,500 HOUSING UNITS PER YEAR (IN LINE WITH CITYPLAN '91 FOR 10 YEARS) REPRESENTS:

- AN ANNUAL RATE OF 350,000 M² OF RESIDENTIAL BUILDING CONSTRUCTION
- AN ANNUAL CONSTRUCTION INVESTMENT OF \$400 MILLION, AND
- 7,000 PERSON YEARS PER YEAR OF DIRECT AND INDIRECT EMPLOYMENT

• ENVIRONMENTAL IMPLICATIONS

- AT CENTRAL AREA DENSITIES - 16HA(40 ACRES) OF LAND VS. 280HA(700 ACRES) OF LAND IN SUBURBS

an additional 1,200-2,000 person trips by auto in the peak hour. This addition would constitute some 4 to 6 per cent of the low end of the anticipated increase in person trips, and about 2 or 3 per cent of the high end.

7.4.2 GO Transit Can Carry Most or All of the Growth

There are several reasons for concluding that GO Transit rail commuter service must be the workhorse to serve increased future travel to the Central Area:

- It has demonstrated its capability to do so over the past 15 years, having achieved a ridership increase from 10,000 person trips in the a.m. peak period in 1975 to 36,000 person trips in 1990 (further increased to 41,000 in 1991) during the peak three hours (an increase of 260 per cent between 1975 and 1990) at the same time as the remaining transit system increased its ridership from 151,000 to 170,000 (an increase of 12.6 per cent). Travel by automobiles and taxis experienced little growth in the peak period, carrying 107,000 people into the Central Area in 1975 and 110,000 in 1990, an increase of 2.8 per cent. A further example of the expansion capability of commuter rail service was the 20 per cent increase in train runs and the 50 per cent increase in passengers carried (up from 90,000 to 137,000) on 12 September 1991, the first day of the 1991 TTC transit strike.
 - GO Transit is well suited to serve trips from the suburban regions surrounding Metropolitan Toronto, and this is where 85 per cent of the growth in peak-hour travel demand to the Central Area will be coming from.
 - GO Transit already has access to the necessary railway right-of-way, so that expensive and disruptive procedures to acquire new right-of-way are not necessary.
 - The line haul and stations/terminal capacity of GO Transit can be expanded incrementally with a cost-effective investment program that anticipates, encourages, and keeps pace with ridership growth.
- It is essential, therefore, that continuing growth in GO Transit capacity and service level be achieved, in order to accommodate growth in peak-period demand to the Central Area. The present (1991) GO Transit ridership to Union Station of some 26,000 person trips in the a.m. peak hour will have to be expanded, at the low end of the range by some 30,000 person trips (an increase of about 115 per cent) and at the high end by some 45,000 person trips or more (an increase of more than 173 per cent).



7.4.3 Additional GO Transit Stations Can Serve and Help Shape the Central Area

While the capacity of Union Station can be greatly increased, for example by construction of the west concourse, the expanded station and, in particular, the Union subway station serving it would be severely strained by a peak-hour GO ridership of 71,000 or more, compared to 26,000 today.

Some relief (an estimated diversion of about 10 per cent of peak-hour ridership) could be achieved by routing some GO trains along the CP North Toronto subdivision, with connections to the Spadina subway line at Dupont, and the Yonge Street subway line at Summerhill, but an equal or greater diversion could be achieved by constructing the two proposed shoulder stations in the Central Area: in Garrison Common just west of Strachan Avenue, and in the vicinity of Cherry Street.

These additional stations would attract and serve intensified residential and employment growth, as well as off-loading ridership demand from Union Station, thereby helping to diversify and distribute balanced, intensified development at key locations in the Central Area.

7.4.4 Feeder/Distributor Transit is Necessary

Initially, improved Central Waterfront transit service could be provided by TTC bus service with connections to the Bathurst streetcar, the Harbourfront LRT, and the Spadina LRT (when completed), using transit priority/high-occupancy vehicle lanes as appropriate to provide faster and more regular service. As development occurs in the Central Waterfront, the next requirement will be an effective transit link between the Strachan Avenue GO station and the downtown core. A northward streetcar tunnel from the Strachan Avenue station, running eastward under Queen Street to a turning loop in the vicinity of Sherbourne Street, plus a streetcar tunnel southward through Exhibition Place and then eastward at grade along Queen's Quay to link with the existing Harbourfront LRT line, could serve as the first links. They would be followed by a further extension eastward under Queen Street and then southward under Cherry Street and westward at grade along Queen's Quay to complete the Light Rapid Transit loop, serving both shoulder stations and tying together many important communities in the Central Area.

Other feeder/distributor transit alternatives are possible, including an LRT line along Bremner Boulevard or on another east-west alignment. However, the loop system as proposed would have the significant advantage of improving service levels provided by the existing Queen streetcar line in its central section; other streetcar services (for example, an extension eastward along Commissioners Street and/or westward along Lake Shore Boulevard), could also be



*"When completed,
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and the Central Area
subway system
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with a people-oriented
Central Area."*

accommodated in the loop system. This would be a significant benefit to users of the Queen streetcar line by converting an extensive central section, some five kilometres (three miles) in length, to rapid transit operation.

Throughout the Central Waterfront, as the arterial road system is constructed and development proceeds, local transit service would be provided by buses on the arterial roads, using transit priority and HOV lanes as appropriate, connecting to the GO Transit stations, subway stations, and existing/proposed streetcar and LRT lines in the area, and serving the existing and new land uses.

7.4.5 Other Central Area Transit Improvements Are Desirable

The overall increase in a.m. peak-hour auto and transit travel demand to the Central Waterfront, from the north as well as from west and east, is expected to range from 45,000 to 68,000 person trips by 2021, on a 1986 base of 90,000 person trips. This 50 to 76 per cent increase can be expected to exacerbate the already severe congestion problems at the Yonge/Bloor subway station and growing pressures at the St. George station from persons wishing to transfer from the Bloor/Danforth subway line to the Yonge or University lines. The problem arises from the fact that Toronto's midtown is served by four radial subway lines, only two of which extend southward to the core.

Constructing a subway extension southward under Spadina Avenue and eastward under Front Street to link with the Yonge Street line, in conjunction with introduction of a simplified version of the "Y" operation between the Bloor/Danforth line and the University line that would stub-end at Union Station or at the waterfront, would be effective in relieving these problems: it would provide direct, no-transfer subway service from the west, north, and east to downtown. This could be a long-term improvement, preceded by implementation of the Spadina LRT as now planned by the TTC; but LRT designs should leave the option open to the extent possible.

When completed, the LRT loop system (estimated cost: \$675 million) and the Central Area subway system improvements (estimated cost: \$640 million) would provide the centre of Canada's largest metropolitan area with a rapid transit system capable of encouraging and serving continuing growth in a sustainable manner compatible with a people-oriented Central Area.

7.5 CONNECTED ROADS ARE THE SKELETON

7.5.1 The Gardiner/Lake Shore Facility Is Important but Its Role Is Changing

The Gardiner Expressway and Lake Shore Boulevard serve a strategic purpose by providing a direct radial link into the metropolitan core from the west (capable of carrying some 10,000 vehicles per hour) and from the east (capable of

carrying about 8,500 vehicles per hour) with a direct expressway connection to the Don Valley Parkway in the east, such that through trips between the Queen Elizabeth Way in the west and the Don Valley Parkway in the northeast can be accommodated on a limited-access roadway.

In 1986, some 20 per cent of auto trips inbound on the Expressway at Bathurst Street in the a.m. peak period were through trips that also crossed the Don River, while the remaining 80 per cent were bound for a Central Area destination. Of the latter, close to 70 per cent from the west originated beyond the boundaries of Metropolitan Toronto, showing the importance of this strategic roadway in serving long commuting trips. Some 40 per cent of trips from the east on the Expressway were through trips. Of the 1,000 to 1,200 through auto trips in the a.m. peak hour on the Expressway in each direction, some 53 to 60 per cent have both origins and destinations within Metropolitan Toronto. In addition, there are an estimated 250 to 350 through truck trips in each direction on the Expressway in the a.m. peak hour, of which 60 to 90 in each direction are heavy trucks.

About 15 per cent of daily traffic movements on the Expressway are truck trips (10 per cent in the peak period), again emphasizing the importance of the facility for trucks carrying goods and for service vehicles.

It is therefore essential that the Gardiner Expressway be retained or appropriately replaced — i.e., in such a way as to maintain effective and efficient regional transportation in the corridor with sufficient capacity to serve existing and future land uses.

In this context, it is important to note that the Expressway's role in carrying both person trips and heavy truck trips has been declining in absolute and relative terms. It carried 21 per cent fewer a.m. peak-period person trips to the Central Area in 1990 than in 1975 (partly reflecting the effect of maintenance activities in 1990) and its share of total person trips in the a.m. peak period to the Central Area dropped from 10.4 per cent in 1975 to 6.9 per cent in 1990. It carried about 2,600 heavy truck trips into the Central Area in the a.m. peak period (including about 390 to 510 through trips) in 1975, which had dropped to about 720 heavy truck trips (of which about 100 to 140 were through trips) by 1990, reflecting the migration of heavy industry from the Central Waterfront and adjacent areas to lower-cost suburban locations.

On the other hand, light truck traffic on the Expressway in the a.m. peak period into the Central Area grew from about 2,970 trips in 1975 to about 5,050 in 1990, much of it made up of courier and other relatively small delivery and service vehicles, serving Central Area land uses.



7.5.2 The Benefits of a Long Tunnel Would Not Justify Its Cost

A major conclusion of the study is that **burying** the Expressway in a long tunnel would not be justified economically in terms of achievable benefits relative to the options of **retaining** or **removing** the Expressway.

A **long tunnel**, either under or close to the existing alignment of the elevated Expressway, or under new fill along the shoreline, would create some land-use/urban design benefits and would also retain a limited-access road connection through the corridor; however, the land-use/urban design benefits of **removing** the Expressway and replacing it by arterial roads were found to be significantly greater than those from a long tunnel. This is due not only to the continuing environmental impact of a shoreline tunnel but to the fact that entry and exit ramps would be required for both of the long tunnel options at three major interchanges; the ramps and portals would consume a considerable amount of land and would be hard to traverse, while the additional north-south traffic crossing Queen's Quay to and from a waterfront tunnel would have a severe impact on the amenities of the entire waterfront, including Harbourfront.

While a tunnel under the shoreline would create new land, much of which could be a linear waterfront park, the negative impact of major ramps serving the tunnel would be quite pronounced and the size and amenities of Toronto Bay would be reduced. The challenge, we suggest, is not to create new land by further filling Toronto Bay but, rather, to make better use of the extensive land already available in the Central Waterfront.

7.5.3 Retaining the Expressway with Amelioration Could Reduce its Barrier Effects and Improve the Central Waterfront as a Place

Retaining the Expressway is a viable option in that considerable land-use/urban design improvements can be achieved, as described in Chapter 6 and more fully in the technical report. These are equivalent to the land-use/urban design benefits achievable by placing the Expressway in a long tunnel, and much less expensive.

The three concepts studied under this option included ramp changes to reduce their barrier effects and improve traffic flow, as well as moving Lake Shore Boulevard from under the Expressway in order to allow open space connectors and continuous streetfront activity on north-south streets to continue underneath the elevated Expressway and, thereby, reduce its barrier effects. Other important improvements are possible while **retaining** the elevated Expressway, particularly on north-south streets. These could include better illumination under the Expressway and improved visual treatment of its support piers and bents, more continuous and safer sidewalks and crossings for pedestrians, creation of special pedestrian and bicycle paths, creation of higher elevation of some land areas to the north



of the Expressway to reduce its visual intrusiveness from the north, and other ameliorative actions, including the many positive recommendations in this regard from the Gardiner/Lake Shore Task Force.

However, while such ameliorative actions would definitely reduce the barrier effects of the elevated Expressway and improve the amenities of the Central Waterfront as a place, the remaining elevated Expressway would always be a break point in the land use, buildings, visual links, pedestrian connections, and other important attributes of that strategic area.

7.5.4 The Barrier Effect Is Most Pronounced in the Central Segment

Examining that effect in various parts of the Central Waterfront, it was noted that the barrier effects are less critical in the western section (between the Humber River and Jameson Avenue) and the eastern section (east of the Don River). The section between the Don River and Yonge Street is also less critical because rerouting it would still leave the partially elevated rail corridor (located on a berm some 5-8 metres [15-25 feet] high) as a barrier. The recently released *Preliminary Master Plan for Garrison Common* prepared on behalf of the Royal Commission has concluded that, while the proposed open space and land-use concept would be more effective if the Expressway were in a tunnel between Jameson Avenue and Bathurst Street, the proposed concept could also be achieved if the elevated Gardiner Expressway were retained.

Our study has found that the worst barrier effects of the elevated Expressway occur in the central segment, between Bathurst and Yonge streets. There are several reasons for this:

- the location of Lake Shore Boulevard directly underneath the elevated Expressway creates a very strong barrier that precludes effective urban development across it and makes north-south links difficult both functionally and visually;
- the Gardiner/Lake Shore facility is quite close to the waterfront in much of this segment and is particularly intrusive on the waterfront setting and continuity between the waterfront and the remainder of the City;
- because of the location of ferry services to the Toronto Island Park, Harbourfront, and related activities, achieving improved pedestrian and bicycle connections, as well as visual continuity, is particularly critical to improve recreational, residential, tourist, and employment amenities in the area.

The option of **retaining** the elevated Expressway indefinitely is viable and would allow considerable **place** and **corridor** improvements in the Central Waterfront, but ultimate **removal** of the central segment of the Expressway would create opportunities for a higher-quality **place** in that important part of the Central Waterfront, as summarized below.



7.6 GARDINER/LAKE SHORE CHANGES ARE OPTIONS WHICH CAN FOLLOW

As noted in Chapter 2, the Royal Commission's objectives for the Central Waterfront are to improve it both as a **place** and as a **corridor**. This includes improving the relationship and links between the region, the central city, and the waterfront while upgrading the overall transportation system to and through the Central Waterfront. The assessment indicates that **retaining** and/or **changing** the Gardiner Expressway and Lake Shore Boulevard, in various parts of the Central Waterfront as discussed below, are the most promising concepts.

7.6.1 Retaining the Expressway Is a Low-Risk, Relatively Low-Reward Option

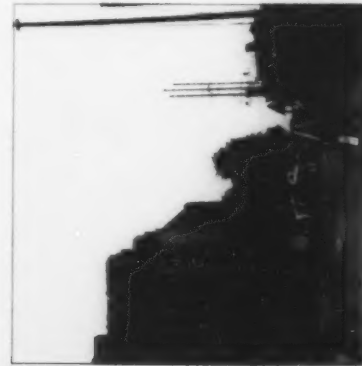
If the average ratings for the four criteria are simply added together, unweighted, the lower-risk concepts **retaining** the elevated Expressway emerge with the highest scores, in particular Concept 1b. This would include extending Front Street westward to intersect with the Gardiner Expressway, widening the Expressway from that point to the Humber River, creating two continuous east-west arteries (Bremner Boulevard and a waterfront drive formed by connecting Lake Shore Boulevard in the west to Queen's Quay and Queen's Quay in the east to Commissioners Street), expressway ramp improvements, and moving Lake Shore Boulevard from under the Expressway; it would also include other ameliorative actions such as those recommended by the Gardiner/Lake Shore Task Force, to reduce the north-south barrier effects of the remaining elevated Expressway.

While providing the opportunity for considerable amelioration, however, the **retain** options are found to be less effective than the **remove** options in achieving a high-quality built form and environment in the Central Waterfront.

7.6.2 Removing Part of the Expressway Would Allow a Better Place to Emerge

If, on the other hand, a higher weighting is assigned to land use/urban design, reflecting the Royal Commission's stated objective of greatly improving the quality of the Central Waterfront as a **place**, the concepts involving **removal** of the Expressway emerge with the highest scores, in particular Concept 2c; it would involve essentially the same arterial improvements as in Concept 1b, except that Bremner Boulevard would not be extended west of Bathurst Street and the central segment of the elevated Expressway would be replaced by a six-lane arterial road.

The promise of such a road system concept is that it would provide the opportunity for greatly improved built form and urban environmental quality in the central segment of the waterfront. However, because of the resultant reduced road capacity, abrupt removal of the Expressway — in the absence of a program to achieve substantially greater housing in the Central Area (accompanied to the extent possible by more compact, nodal, mixed-use urban structure



throughout the GTA), greatly improved transit services to and within the Central Area, and an improved arterial road network in the Central Waterfront — would risk significantly increased road traffic congestion with the possible risk of economic growth constraint from reduced competitiveness.

7.6.3 Removal Would Require Prerequisite Actions

This leads to the conclusion that, if the benefits of **removing** the central section of the Expressway are to be achieved at reasonable risk, such **removal** would have to be preceded by effective implementation of the land-use, transit, and arterial policies described. This suggests, in turn, that a decision on whether or not to **remove** the Expressway could be made as early as five years from the beginning of the implementation program, or longer if implementation were delayed.

In the meantime, significant transportation and land-use/urban design amelioration could be achieved by moving to a concept similar to Concept 1b, so that development could proceed with appropriate increases in transportation capacity and service. This is based mainly on greatly improved transit service but also involves marginal increases to road capacity, particularly by implementing the Front Street extension and two continuous east-west arteries, while partially moving Lake Shore Boulevard from under the Expressway in the central segment.

7.6.4 Evolution Is Possible from Retaining the Expressway and Ameliorating Its Effects to Removing It

The basic question then arises: would it be possible to implement a version of Concept 1b, perhaps with some modifications, that would keep open the option of evolving later to a concept in which the central segment of the Expressway were **removed**, after the requisite land-use, transit, and arterial road policies had been effectively implemented?

While it was not possible within the scope and time available for the study to pursue this investigation in detail, the Study Team assessed the question in conceptual terms and concluded that it would be possible to achieve such an evolutionary path. This could involve full or partial implementation of Concept 1b, in conjunction with the greatly expanded transit service and improved land-use policies described earlier, assuming that possible evolution to a system with the Expressway **removed** would occur in the longer term.

The type of road system into which it might evolve is illustrated in Exhibit 31, labelled Concept 2x. It includes the Front Street extension and the two continuous east-west arteries (Bremner Boulevard and the interconnected

waterfront drive) largely as described earlier for Concept 1b, (although Bremner is shown in a more southerly alignment in the vicinity of Fleet Street) with the central segment of the Expressway replaced by an eight-lane urban boulevard or "grande allée" similar in size and nature to University Avenue south of College Street.

Detailed capacity analyses for this concept, like those carried out for the other nine road concepts, were precluded by time and budget limitations. Nevertheless, it is likely that Concept 2a could be intermediate between concepts 2a and 2b in terms of its effective road capacity: probably less capacity than 2a because it might not accommodate turning movements into the core as effectively as would the one-way pair of east-west roads in that concept, but more capacity than 2b because Bremner Boulevard would be a continuous artery passing north of Exhibition Place and linking to the Gardiner Expressway and/or Lake Shore Boulevard in the vicinity of Jameson Avenue.

Among the major factors affecting a road network's capacity are the continuity of the roads, the number of lanes on each road and the effective capacity per lane, as well as the traffic mix, average intersection spacing, and ability of the network to handle turning movements. The Gardiner Expressway can carry approximately twice as many vehicles per hour as Lake Shore Boulevard on a lane-for-lane basis, and about three times as many as conventional urban arterial. The latter has less capacity per lane because of the "friction" effects of factors such as parking, loading, intersections, pedestrians and turning movements. If a section of the Expressway is to be replaced by a reasonable number of arterial lanes, the vehicular capacity per arterial lane should be as high as possible (e.g., closer to that of Lake Shore Boulevard than of a more conventional urban arterial) but this has to be done in a manner which also respects the amenities of the road as a public **place**.

Some metropolitan areas, especially in Europe, but also in North America, have successfully addressed this by creating the **urban boulevard**, which distinguishes the **corridor** functions (a roadway six or eight lanes wide with relatively high capacities per lane) from the **place** aspects (one or two service lanes on either side of the main roadway, separated from it by sidewalks, trees and shrubs, with sidewalks also between the service lanes and the building fronts, such that street front/pedestrian activities are effectively protected from the through traffic).

An approach such as this could increase the effective vehicular capacity of Concept 2a while also improving the **place** attributes of the area served. The objective would be to maintain as much as possible of the vehicular capacity of the current road system in the Central Waterfront, in a manner which is more appropriate to the urban environment and



which minimizes the cost of new construction. This could be achieved by the equivalent of approximately ten high-capacity east-west arterial lanes in the west part of the Central Waterfront, and a proportionately smaller number in the east part.

As shown in Exhibit 31, the actual point of transition in Concept 2x between the Expressway and the urban boulevard in the west could lie in a broad geographic range, between points west of Strachan Avenue and west of Spadina Avenue; a similar transition range exists in the east, between points east of Yonge Street and east of Cherry Street. The transition points illustrated in Exhibit 31 show the **removal** of a relatively small segment of the Expressway, between west of Spadina and east of Yonge Street. Under this circumstance, the length of the boulevard would be approximately the same as that of University Avenue between College and King streets.

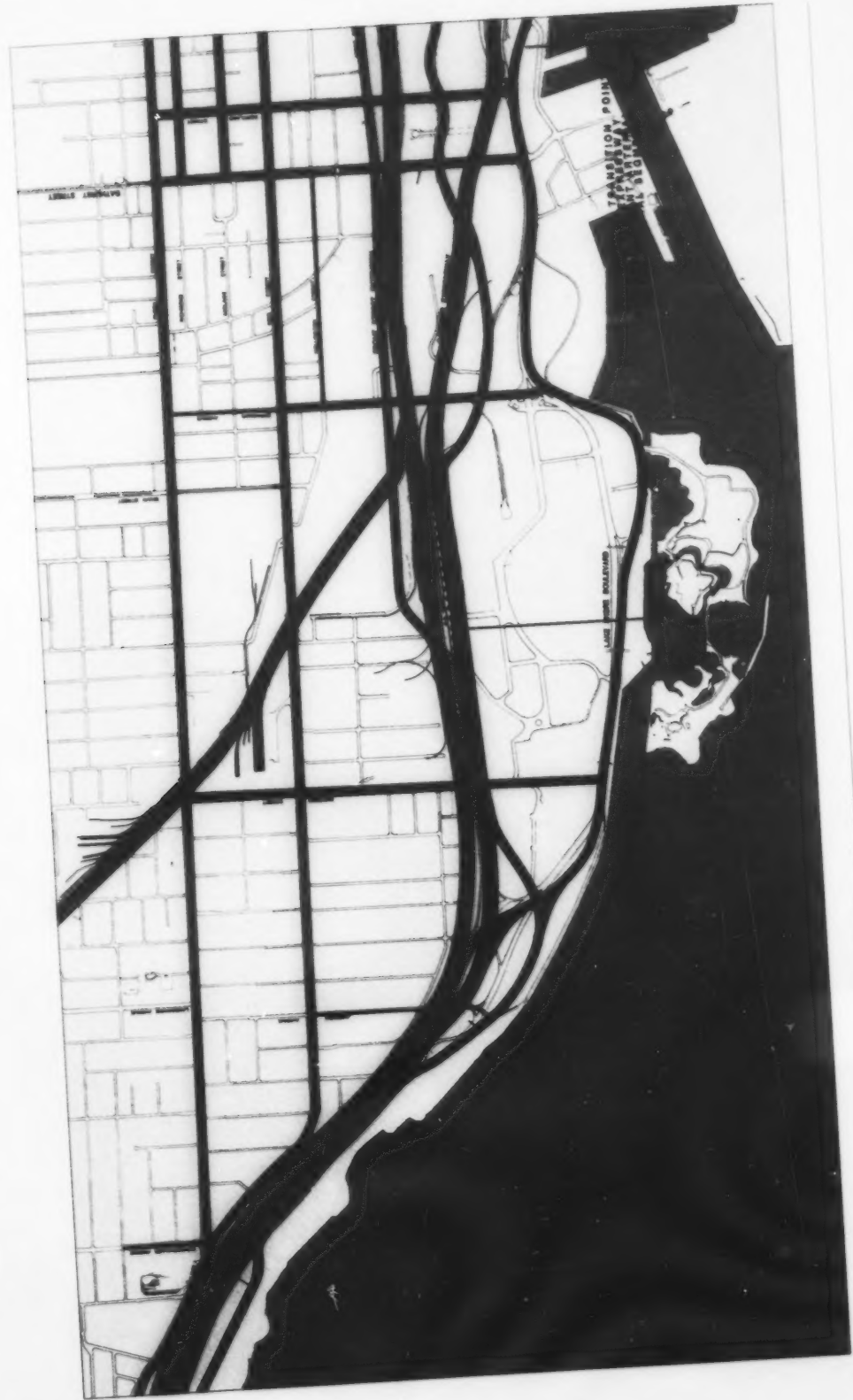
The transition ramps from an elevated Expressway to an at-grade arterial road would be significant barriers to north-south links. This would suggest that the transition point in the west should be west of Strachan Avenue, before the Expressway starts to rise. On the other hand, removal of a shorter section of the elevated Expressway (e.g., between Spadina and Yonge) would achieve significant quality of **place** benefits in the key central section while imposing less of a travel time penalty on through traffic. Similar **place/corridor** trade-offs apply east of Yonge Street although the **place** benefits of **removing** a longer section of the Expressway would be less pronounced because of the immediately adjacent railway berm and its attendant barrier effects.

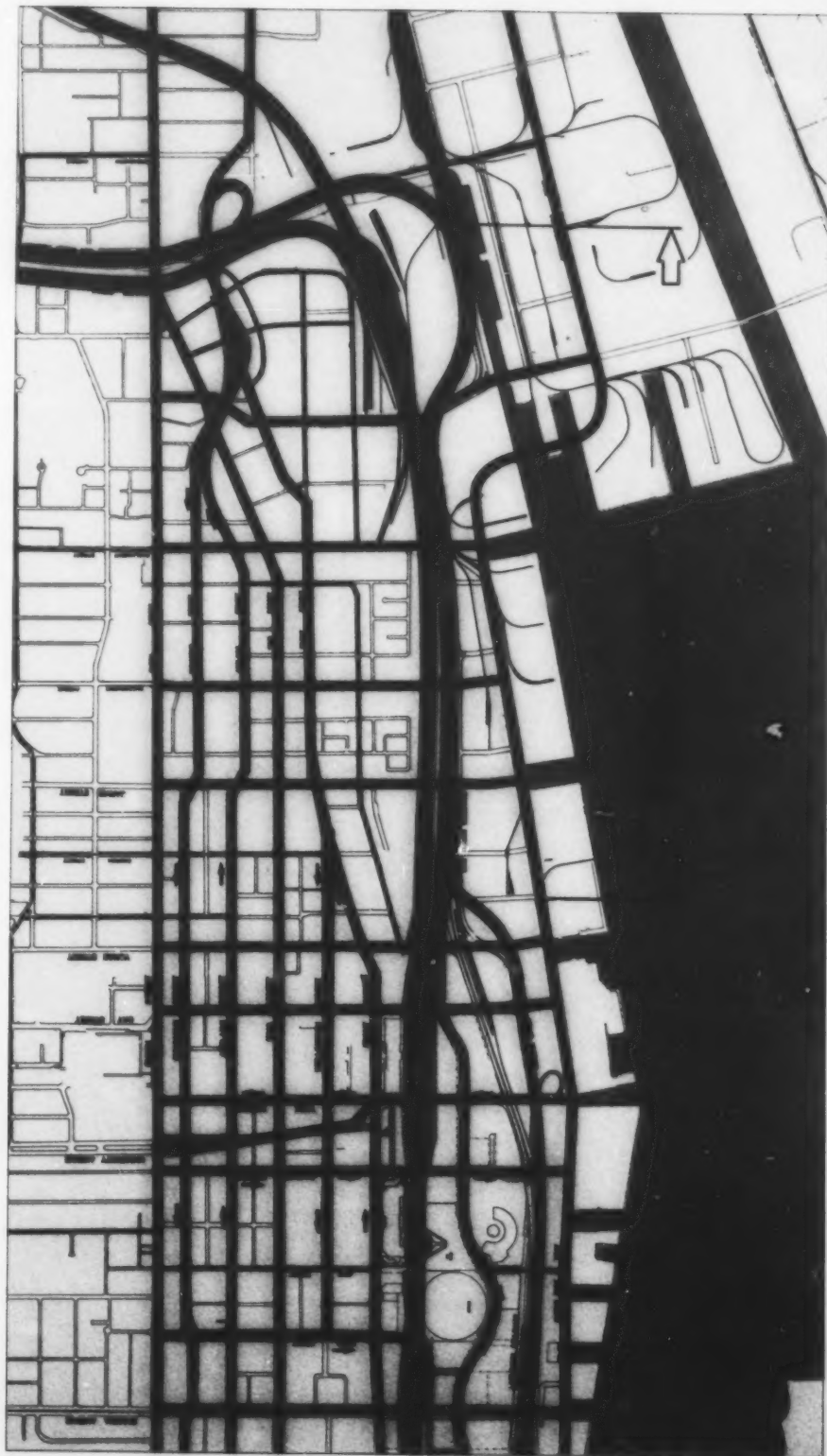
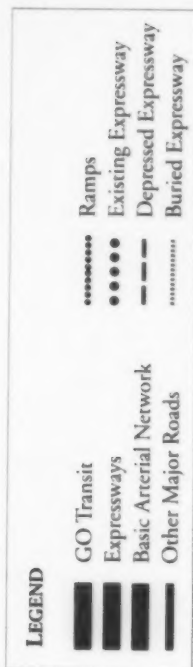
It should be stressed that concept 2x was not subjected to the detailed capacity analyses carried out for the nine road concepts described earlier. This concept serves, however, to illustrate a possible road system into which a full or modified form of Concept 1b might evolve if it were decided to **remove** the central segment of the Expressway once the prerequisite programs were effectively in place. More detailed planning and design of the preferred road, transit, and green infrastructure concepts, in conjunction with further development and agreement on land-use plans and urban design concepts, would be required to provide the necessary basis for implementation.

7.6.6 The Retain/Remove Option Can Be Kept Open

Possible modifications to Concept 1b, particularly if it were decided to move as quickly as possible to **remove** part of the Expressway (e.g., within five years of the beginning of the implementation program) could include moving the westbound Lake Shore Boulevard from under the Expressway between Yonge and Simcoe streets only and leaving Lake Shore Boulevard in place between Simcoe Street and Spadina Avenue, while retaining all or most of the ramps in that segment in their existing forms. The reasons for reducing the changes in the Spadina-Simcoe segment would be to

EXHIBIT 31
ILLUSTRATIVE ROAD SYSTEM CONCEPT 2X
*Generic road concept with the central
 section of the elevated expressway removed.*





avoid making investments that would subsequently be negated if the elevated Expressway were **removed**. An early decision on these matters would have obvious advantages by providing a clear framework for ongoing development and infrastructure decisions and delivery.

A related question of considerable importance is whether or not the Gardiner Expressway should be widened around Humber Bay as part of the initial improvements. This project fits logically with construction of the Front Street extension and improvement of the Humber River bridges, both of which are seen as essential. On the other hand, the additional Gardiner Expressway capacity around Humber Bay, which could be effectively utilized as long as the Expressway is **retained** in place with the other arterial improvements, would not necessarily be in balance with the reduced capacity if the central segment of the Expressway were subsequently **removed**. Several alternatives are possible, including early widening of the Gardiner with immediate dedication of the new lanes to transit priority and high-occupancy vehicle (HOV) uses. An initial step in the decision process regarding widening of the Expressway around Humber Bay will be the result of the Environmental Assessment of this project, currently being carried out.

7.6.6 Adaptive Building Designs Are Possible

Another important question in considering such an evolutionary path, if a version of Concept 1b were initially implemented followed by evolution to a version of Concept 2x, is whether or not developers would be able to design and construct buildings in the context of Concept 1b that would be consistent with later realization of the urban design and built form benefits of evolving to Concept 2x. As discussed earlier, urban designers on the Study Team concluded that it would be feasible for "defensive buildings" to be constructed next to the elevated Expressway, consistent with later conversion to provide appropriate frontage on an urban boulevard.

One example of such an adaptive design includes placing parking bays on the first few storeys of buildings on the side next to the elevated Expressway and later converting them to residential uses fronting on the urban boulevard. Another example includes designing towers as slab buildings in a north-south orientation, set back from the Expressway with utilities located in lower floors next to the Expressway; if and as the Expressway were later removed, lower-rise buildings would be constructed with appropriate retail, office, and residential uses, fronting on the urban boulevard complementing — and, in some cases, linking — the higher buildings.

It is likely that at least some developers and their architects would rise to this challenge if the concept of evolving from the elevated Expressway to an urban boulevard or grande allée were known to them at the time of building design.

7.6.7 More Continuous and Connected Arterial Roads Are Necessary

A more continuous and effective arterial road system is required to serve the Central Area. Examples of road interconnections, based on the illustrative concepts studied, include:

- extension of Front Street westward to connect to the Expressway or Lake Shore Boulevard west or east of Dufferin Street. This is a vitally important link both to serve emerging land-use changes in the area and to provide a direct means for some automotive traffic from the west to enter the Central Area north of the railway corridor directly without having to penetrate the Central Waterfront east of Strachan Avenue and south of the corridor. For these reasons, and also because its existence would make it much more feasible to accommodate traffic while other changes to the road and transit system in the Central Waterfront are under construction, the Front Street extension was included in all road system concepts studied and is considered an essential element in any future system;
- a continuous Lake Shore Boulevard/Queen's Quay/Commissioners Street as a waterfront drive;
- another continuous east-west arterial road south of the railway corridor, probably based on eastward and westward extensions of Bremner Boulevard (the Esplanade) with use of grade changes and landscaping to carry north-south green links (e.g., in Roundhouse Park) over the arterial and maintain the primacy of the green infrastructure system.

A variety of urban arterial street systems, including additional north-south streets to strengthen the city's connection to its waterfront, are possible, as illustrated by the nine illustrative concepts studied, each of which would have transportation, land-use/urban design, and other consequences (summarized earlier and described more fully in the technical report).

Because **removal** of the elevated central section of the Gardiner Expressway would lead to an estimated reduction in corridor capacity in the range of 33 to 45 per cent, it would be appropriate to make such a decision only after land-use, transit, and arterial road changes such as those discussed above were successfully in place.

7.6.8 Creation of More Road Capacity Can Be Managed as an Interim Step

The issue has been raised that, if improved arterial roads were in place before the Expressway could be **removed**, these roads would tend to fill up with traffic in the peak periods, reflecting the basic shortage of road capacity in the central parts of large urban areas. Therefore, a subsequent decision to **remove** the Expressway would never be made because those responsible might point to increased traffic volumes as an argument for keeping the Expressway in place.

We suggest that the primary test for **removal** of the Expressway would not be the level of traffic on the new arteries but, rather, other factors: the effectiveness of improved land-use policies in reducing growth pressures for long-distance commuting trips to the Central Area; the establishment of substantially increased transit services to the Central Area, especially on the GO Lakeshore and Milton lines, with appropriate transit feeder/distributor services; and a more interconnected and continuous network of urban streets in the Central Waterfront.

If those programs are at least partially in place, peak-period automotive traffic is stabilized, and the transit system and arterial road network are functioning well, **removing** the Expressway could be contemplated: the transportation system would have the required capacity and flexibility to allow additional discretionary commuters to shift to transit following **removal** of the Expressway segment. Designation of transit priority and high-occupancy vehicle (HOV) lanes on the new arterial and local roads, as appropriate, would also encourage their use, from the beginning, to serve more **people** rather than focusing solely on vehicular volumes.

It must be stressed again, however, that the cost of attempting to **remove** the Expressway without these programs at least partially in place — in terms of substantially increased levels of automotive traffic congestion, increased trucking delays and costs, and the risk of reduced economic competitiveness that could mean diversion of growth not only to other Canadian cities but to U.S. centres — would be too high, given the extreme importance of maintaining and improving the economic competitiveness of Greater Toronto, Ontario, and Canada in the context of free trade and increasing competition from foreign producers in North America and abroad. Establishing an effective network of urban streets and arterial roads is necessary to serve and help shape development in the Central Area and for its economic efficiency, whether the Expressway is retained or removed.

With appropriate government management, economic growth, and continuing increases in transportation demand, sufficient pressures will exist for the necessary infrastructure investment to improve and ameliorate the retained Expressway while keeping open the option and working purposefully towards the possibility of removing it subsequently.

7.7 TRANSPORTATION MANAGEMENT IS THE CHALLENGE

7.7.1 Effective Transportation Management Is Public Policy at All Government Levels

Transportation management involves elements of **supply** — providing expanded and more attractive transit services, removing discontinuities, and providing safer roads, sidewalks, and pedestrian crossings, etc. — and elements of **demand**, including control and information systems, regulations, and other incentives for travellers to use the

transportation system as efficiently as possible. A wide variety of transportation management measures have been in effect in Greater Toronto for many years and others are being implemented or considered.

Even if the Gardiner Expressway is **retained** and its capacity is expanded slightly, significant transportation demand management measures will be required to provide the necessary capacity and balance of modal use to allow transit to carry virtually all the future growth in transportation demand. As discussed, these primarily include greatly expanded GO Transit services to the Central Area, other transit improvements such as the Waterfront and Spadina Light Rapid Transit lines, expanded bus service as the road network is interconnected in the Central Waterfront, and — as warranted by the pace of development — the LRT loop system. In the longer term, midtown to downtown subway improvements could be added. More Central Area housing and a completed arterial road network in the Central Waterfront are also basic requirements. Additional transportation demand management measures include the Gardiner/Lake Shore Corridor traffic management and driver information system (currently being designed), parking and loading regulations, HOV lanes, and many others.

It is anticipated that, through measures such as these, the significant increase in person travel and goods movements that can be expected into and through the Central Waterfront during the coming 30 years can be accommodated. Most or all of the growth in person trip demand would be carried on transit, thereby maintaining stability in automotive traffic volumes while marginally improving the efficiency and capacity of the road network for person and goods movements.

7.7.2 Central Area Parking is an Important Policy Lever

A particularly effective transportation management measure affecting peak-period auto traffic into the Central Area and Central Waterfront is the supply and pricing of Central Area parking. A reduced supply of spaces available for all-day parking, coupled with higher rates, provides a strong incentive for commuters to the Central Area to use transit. Actions resulting from the Central Area Parking and Loading Study, carried out for the City of Toronto in the mid-1970s, ongoing initiatives by the Toronto Parking Authority, and the impact of the Commercial Concentration Tax as



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it applies to parking structures, have resulted in significant price increases for all-day parkers, some reallocation of available spaces to short-term parkers (who tend to travel at off-peak times), and discounted prices for all-day parkers arriving before the morning peak hour (thereby spreading the peak). These measures have helped to reduce peak-hour auto travel and encourage greater use of transit.

Further steps in this direction can be expected over the coming years, reflecting the transportation management requirements outlined above and the economic impact of higher land prices in the Central Area. It is important, of course, that such steps be taken in conjunction with increases in transit capacity and service levels in order to avoid undue hardship and/or economic constraint on Central Area growth. Extension of parking supply and pricing policies as applied over the past one or two decades can be expected for the coming two or three decades, to help stabilize or possibly reduce peak-period auto travel to the Central Area.

7.7.3 Transportation Management Results Will Help Provide a Basis for Decisions Regarding Changes to the Gardiner/Lake Shore Facility

The question in possibly removing the central section of the Gardiner Expressway and/or making other changes affecting road capacity for automotive traffic is whether transportation management measures could achieve the necessary stabilization or reduction in automotive travel into and through the Central Waterfront. This would have to be commensurate with reduced vehicular capacity in the corridor road system, such that road traffic congestion and delays would not rise unreasonably.

While it is impossible to answer this question reliably at present, a number of important actions can be taken that will not only provide a better basis for making this decision but will also enable the Central Waterfront to become a higher-quality place in terms of urban design, environment, and related amenities, able to support greatly increased residential, commercial, urban industrial, and recreational uses. The actions in the basic program outlined in the next chapter can be carried out in a way that leaves open the option of whether or not the central section of the Expressway should be removed and/or other changes made to the Gardiner/Lake Shore; implementing them will provide important information as a basis for making that decision.

SUGGESTED ACTIONS

8.1 STAGE 1 PROGRAM

A variety of environmental, land-use, and transportation improvements are described and discussed in the technical report. From these, the Study Team distilled a Stage 1 implementation program which, it was felt, would move the Central Waterfront purposefully towards the stated **place** and **corridor** goals, while keeping open the option of **retaining** or **removing** the central section of the Expressway. Public consultation and government consideration of the information and options put forward in this study are required, followed by more detailed planning and design work and approvals as a basis for this program.

We suggest that, in the main, the policy, planning, and design work can be completed during the next two years, focusing on a subsequent basic program of Stage 1 implementation with a five-year completion target. This Stage 1 program, of which some components could start being implemented during the next two years under the appropriate circumstances, would include:

- beginning of the green infrastructure system;
- a program for the delivery of as many as 3,000-4,000 housing units per year in the Central Area for the next 30 years, starting with appropriate designation of the lands;
- substantial GO Transit expansion in the Lakeshore and Milton corridors, expansion of Union Station, railway



- relocation in the Garrison Common area, and construction of the Garrison Common (Strachan Avenue) GO station;
- related TTC service improvements and connections, initially by means of existing/committed LRT routes and bus routes, as well as new bus routes on the new arterial roads, using transit priority and HOV lanes as appropriate; and
- key road improvements including the Front Street extension, Humber River bridges, and creation of a more interconnected urban street network with the equivalent of two continuous east-west arteries and related north-south interconnections providing better service for pedestrians and cyclists, as well as for vehicles. The latter could include changes to Lake Shore Boulevard and related ramps, depending on the results of more detailed study.

The priorities are clear; for the Stage 1 program, they are:

8.1.1 Green Infrastructure

The basic "green infrastructure" of parks, open spaces, and green links among them, plus steps to improve air, water, and soil quality and other environmental conditions, should be built as early as possible to begin the process of recreating the Central Waterfront as a better place that, while part of the city, is connected to the water and to natural areas. These green area programs should be implemented before or concurrently with the water and to developments, in order to help attract residents to the area while ensuring that the open space system is completely achieved and protected.

8.1.2 Central Waterfront Housing and Economic Development

Substantially increased Central Waterfront housing is essential to improve the quality of the Central Waterfront as a place, to moderate the growth of long commuter trips from suburban areas to the Central Area, and to help achieve an improved structure and quality of development throughout the region. At the same time, continuing development of employment and recreational uses is vitally important to maintain economic impetus. This includes developing the international trade centre and other economic development and tourism initiatives proposed in the Garrison Common study, establishing employment activities in the Railway Lands, and the mixed-use development in other parts of the Central Waterfront described earlier.

8.1.3 GO Transit Expansion

Expansion of GO Transit service and Union Station capacity, along with the Strachan Avenue shoulder station and related rail relocation, are essential to improve the relationship between the region and the centre and to serve the substantial increase in commuting and other trips to the centre that is anticipated, even if Central Area housing targets are met (and they will be much greater if the targets are not met).

8.1.4 Improved TTC Services

Significantly improved local transit is also essential to serve the residential and employment developments and circulation in the Central Waterfront; initially this can be bus services on the improved arterial road network with

HOV lanes as appropriate. This would lead, over the medium term, to implementing other transit improvements such as a downtown LRT loop system linking to the Garrison Common (Strachan Avenue) GO Transit station and later to a Cherry Street GO Transit station.

8.1.5 Better Road Connections

The Front Street extension is required both for local land access and to allow direct regional access from the west to the Central Area north of the rail corridor without having to pass through the south/central section of the Central Waterfront, and should be in place to help carry traffic during the extensive construction work that will be required in the Central Waterfront.

The Humber crossing bridges are required because of the deteriorating quality of the existing structure and related safety and operational imperatives.

The two continuous east-west arterial roads in the Central Waterfront, along with **improved north-south streets and continuous, pedestrian-friendly sidewalks, walkways, cycle paths, and mid-block connectors**, are essential to provide local access, create a legible framework, and re-establish visual and physical links between the city and its waterfront. This could include **partial relocation of Lake Shore Boulevard from under the Expressway, as well as related ramp changes** (discussed earlier) to reduce further the barrier effects of the Gardiner/Lake Shore facility while leaving open the question of subsequently modifying the central section of that facility.

8.1.6 Timing Targets

The goals of the Stage 1 implementation program would be to deliver the initial components of the green infrastructure and other program elements in five years. This includes: a continuous Greenway across the Central Waterfront, Roundhouse Park, etc.; 12,000-20,000 housing units in the Central Waterfront; a 50 per cent expansion of GO Transit peak-period capacity on the key east-west lines, as well as augmented full-day service; the beginnings of improved feeder/distributor transit in the Central Waterfront, initially by means of buses using HOV lanes as appropriate; and a more continuous arterial road network for land access by trucks, autos, surface transit, pedestrians, and cyclists.

This Stage 1 program would be the first giant leap in rejoining the Central Waterfront to both the city and the lake, making it a much better **place to be** rather than just to **travel through**, while still enabling it to fulfill its

important function as a **corridor**. When this basic program is in place and is functioning successfully, it will be possible to make the important decision about **removing** the central section of the elevated Expressway and replacing it with a third east-west arterial road in conjunction with the greatly improved transit that would be largely in place. Additional facilities, such as the LRT loop system or its equivalent, would be in final design or possibly under construction.

8.1.7 No Major New Expenditures

It should be noted that the infrastructure elements listed above either have been included in municipal and/or provincial budgets or are part of the normal development process. The Stage 1 program does not involve large new expenditures not already considered by the governments and private-sector participants. The important point about this program is that it is based on an integrated concept of the Central Waterfront as a better **place** and **corridor** and moves purposefully to achieve that concept, building largely on projects and investments already proposed by individual governments and agencies, selected and modified in light of the overall concept.

At the same time, the Stage 1 program keeps open the option of how best to treat the Gardiner Expressway/Lake Shore Boulevard and related transportation facilities for subsequent action in Stage 2.

8.2 STAGE 2 PROGRAM

The following Stage 2 program would involve remaining infrastructure elements and urban development, as described earlier. These would be expected to include:

- continuing implementation of the green infrastructure system;
- ongoing residential, commercial, urban industrial, and recreational development;
- further expansion of GO Transit services;
- construction of the LRT loop or its equivalent and the Cherry Street GO station; and
- changes to Lake Shore Boulevard, ramps, and possibly the Expressway in the context of a public policy decision regarding further modifications to the Gardiner/Lake Shore facility.

Stage 2 would involve significant expenditures not currently planned or programmed: i.e., for the LRT loop system. Decisions on the timing and nature of such expenditures would be made at the end of Stage 1 and in the light of its progress and results. The overall level of expenditure for Stage 2 would be affected only at the margin by a decision regarding redesign/relocation of the Gardiner/Lake Shore, because most of the program elements will be required regardless of that decision.

8.3 A WINDOW OF OPPORTUNITY

There was a great deal of discussion in meetings of the Study Team and Work Group regarding problems of continuing uncertainty and the need for a clear framework within which ongoing development and infrastructure decisions can be made and implemented. We believe that early agreement among all levels of government regarding the type of Stage 1 program outlined above would provide such a framework. The policy, planning, program, and design details would be developed within the next two years with the target of completing the first stage of implementation during the subsequent five years.

Apart from the importance of reducing uncertainty, there are at least two other major advantages of moving quickly:

8.3.1 Meeting Government Goals and Helping to Recover from the Recession

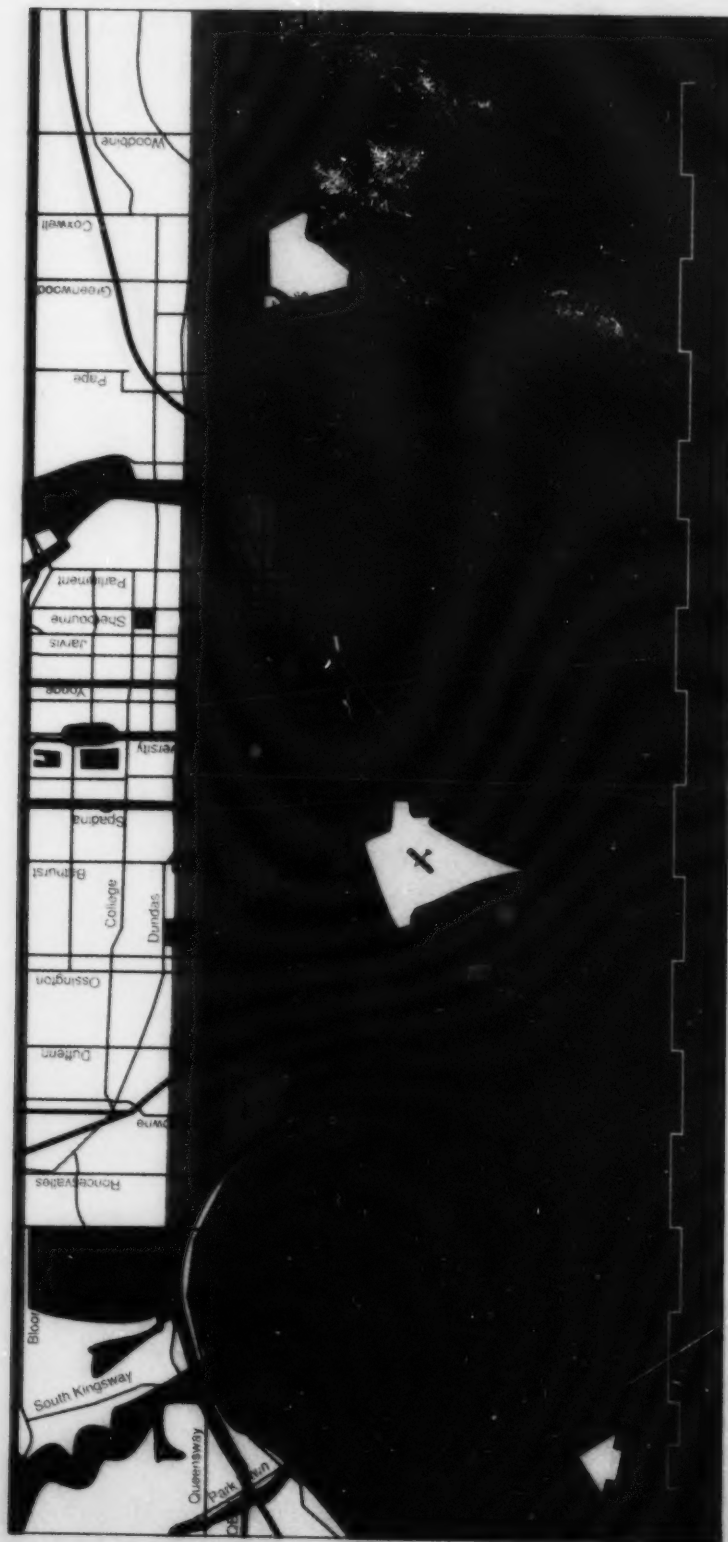
The basic components of the program (green infrastructure, housing and economic development, transit, and road networks) would be very much in line with City and Metro policies for the Central Waterfront and elsewhere and would greatly support the Province's programs of affordable housing, efficient delivery of improved infrastructure (transit in particular), immediate job creation, and economic recovery. Among other important benefits, the program would be a significant stimulus to help lift the strategic centre of the Greater Toronto Area out of its current economic slump.

8.3.2 Providing an Improved Framework for Renewed Commercial Activity

The program would also take advantage of the current pause in commercial development caused by the recession and by the resulting substantial over-supply of commercial space. This means that, while the plans/designs and programs are being developed, there will be relatively little "defensive" building occurring along the Expressway corridor in the commercial sector; therefore, little will be lost on the development side in keeping the option open of removing the central section of the Expressway. Ideally, by the time the commercial sector is ready to move strongly again, the programs will be in place, and a decision will have been made regarding the Expressway. Renewed commercial development could then occur within a firm framework of infrastructure and development programs.

EXHIBIT 32

LAND-USE AND TRANSPORTATION CONCEPT



9.3.3 The Vision

This study envisions the Central Waterfront as an improved **place**, as the result of:

- a green infrastructure system of open spaces, parks, and links;
- positive additional steps to improve the quality of the natural environment;
- a balanced and diverse mix of residential, employment, and recreational uses;
- built form and streetscape design that are pedestrian-friendly and oriented to more livable, workable, accessible, and legible public and private spaces;
- greatly improved public transit at both the regional and local scales;
- an interconnected and balanced road network;
- enhanced opportunities for economic competitiveness and renewal; and
- infrastructure capital and operating costs that are supportable because of the economic activity created.

An important part of that vision is a redesigned and relocated Gardiner Expressway/Lake Shore Boulevard facility to help strengthen the links between the city and its renewed Central Waterfront and improve the area's quality as a **place** while maintaining and enhancing its essential function as a **corridor** serving transit, rail and air passengers, auto travellers, truck, rail, and marine freight movements, pedestrians, and cyclists.

This study has set out a range of transportation options, identified the environmental, land-use, urban design, and economic opportunities and concepts they help make possible, and the required financial resources and related risks involved; it has proposed a Stage 1 program aimed at achieving those opportunities in a cost-effective manner. As illustrated in Exhibit 32, the combined land-use, transit system, and road network concept which could subsequently evolve would be compatible with various treatments of the Gardiner/Lake Shore facility, and the anticipated consequences of these have been described. The Stage 1 program is designed to leave open the more promising options for the central section of the Gardiner/Lake Shore (indicated in the exhibit by the blue and black dashed segment). Implementation of the Stage 1 program will provide a considerably firmer basis than now exists for deciding on the most appropriate option, while moving purposefully to create a better **place** and **corridor** in the Central Waterfront.

Major public policy issues are at stake and decisions taken (or not taken) during the next few years will greatly affect the quality of Toronto's Central Waterfront and adjacent areas for at least the next one or two generations. It has become increasingly clear that a new process is needed for planning and delivering the necessary decisions, agreements, and programs to achieve the bold plan that is within the grasp of this generation.

The challenge is great. The potential rewards are infinitely greater.

*"The challenge is great.
The potential rewards
are infinitely greater."*



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We would like to thank the following Steering Committee members, advisors, and members of the Work Group for their contribution to the *Toronto Central Waterfront Transportation Corridor Study*.

STEERING COMMITTEE

ROYAL COMMISSION ON THE FUTURE OF THE TORONTO WATERFRONT

HON. DAVID CROMBIE, *Commissioner* DAVID CARTER, *Senior Director, Special Projects* WILLIAM ROBERTS, *Senior Director*

FEDERAL GOVERNMENT

HUGUETTE LABELLE, *Deputy Minister, Transport Canada* MILT FARROW, *Consultant Representing the Honourable Darcy McKeough (Harbourfront Issues)* COL. E.R. NURSE, *Base Commander, C.F.B. Toronto*

PROVINCE OF ONTARIO

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MUNICIPALITY OF METROPOLITAN TORONTO

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CITY OF ETOBICOKE

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CITY OF SCARBOROUGH

PETER POOT, Commissioner, Planning and Building Department MICHAEL PRICE, Commissioner, Works Department

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ADVISORS (*IDENTIFIES WORK GROUP MEMBERS)

PROVINCE OF ONTARIO

HOWARD ANDERS, Policy Planner, Toronto Area Co-ordinating Office, Ministry of Transportation BOB BOYLE, Manager, Corporate Planning, GO Transit ROBERT BROCK, Director, Special Events, Ministry of Tourism and Recreation LEIGH COLLINSON, Management Policy Officer, Ontario Place BILL DENNING, Head, Marketing, Research, and Planning, GO Transit *DAVID FERGUSON, Manager, Toronto Area Co-ordinating Office, Ministry of Transportation DAVID MOORE, Senior Manager, Attractions and Operations, Ontario Place BRIAN NIXON, Manager - Central and South-west, Plans Administration, Ministry of Municipal Affairs CHUCK PAUTLER, Research Co-ordinator, Office for the Greater Toronto Area TOM SMITH, Managing Director, GO Transit ELIZABETH STANLEY, Planning Co-ordinator, Ministry of the Environment

MUNICIPALITY OF METROPOLITAN TORONTO

BRIAN DENNEY, Manager, Engineering Department, Metropolitan Toronto and Region Conservation Authority WILLIAM DONALD, Director, Real Estate, Parks and Property Department LEITH DRURY, Executive Assistant to the Manager, Exhibition Place *RICHARD GORDON, Director, Transportation Division, Planning Department *DAVID KAUFMAN, Director, Traffic and Planning Division, Transportation Department NELSON MELNYCK, Manager, Corporate Planning, Corporate Planning Department, Toronto Transit Commission *GLENN MILLER, Project Manager, Planning Department LYNIN MORROW, Co-ordinator, Metro Waterfront Committee, Planning Department *TOM MULLIGAN, Assistant Director, Traffic and Planning Division, Transportation Department *ANNA PACE, Supervisor, Area Studies & Policy, Transportation Division, Planning Department *ROW PRINGLE, Manager, Area Studies & Policy, Transportation Division, Planning Department ROSANNA SCOTT, Director, Corporate Administration, Chief Administrative Officer's Department MICHAEL THORNE, Deputy Commissioner, Works Department JANE WELSH, Planner, Planning Department

CITY OF TORONTO

*MARC BAJANESS, Director, Urban Design, Planning and Development Department BETH BENSON, Research Consultant, Environmental Protection Office *JOE DABRAMO, Senior Planner, Central Waterfront Section, Planning and Development Department *MAGGIE EASTON, Senior Transportation Planner, Planning and Development Department *JANICE GIBSON, Policy Analyst, City Properties Department

GARY HARDING., *Manager, Land Development, Housing Department* *ANDREW KAROPINSKI, *Director, Planning and Programming, Public Works and Environment Department* TED MARTIN, *Manager, Architecture and Urban Design Division, Planning and Development Department* ERIC PUDRONS, *Urban Designer, *JOHN MYNDE, Development and Transportation Engineer, Public Works and Environment Department* EUDORA PINDERGRANT, *Director, Central Core and Architecture and Urban Design Division, Planning and Development Department* SUSAN RICHARDSON, *Director, Parks Planning, Parks and Recreation Department* *NANCY SINGER, *Project Manager, Land Development, Housing Waterfront Division, Planning and Development Department* *GRIG STUWART, *Co-ordinator, Transportation Planning* PETER SIMON, *Waterfront Planner, Parks and Recreation Department* *MAUDWYN WILLIAMS, *Manager - Waterfront Section, Planning and Development Department* Department FLODORA STEWART, *Manager - Railway Lands, Planning Department*

CITY OF ETOBICOKE

*GARY DYNARI, *Principal Planner, Policy and Research Division, Planning Department*

CITY OF SCARBOROUGH

CARL KNIPPEL, *Director, Urban Design, Planning Department* GARY WELSH, *Director, Transportation, Works Department*

FEDERAL GOVERNMENT

SUSAN KELLY, *Senior Policy Analyst, Transport Canada* JO-ANNE KNIGHT, *Regional Director, Policy Co-ordination, Transport Canada* WILLIAM LYE, *Director, Portfolio Management - Land Use, Bureau of Real Property Management* HENRY WEINSENBURGER, *Senior Property Analyst, Bureau of Real Property Management*

ROYAL COMMISSION ON THE FUTURE OF THE TORONTO WATERFRONT

SUZANNE BARRETT, *Director, Environmental Studies* DEBBIE WILLIAMS, *Assistant to the Senior Director, Special Projects*

SPECIAL PURPOSE BODIES

ROBERT GARRARD, *Head, Historical Preservation, Toronto Historical Board* MARINA WILLIAMS, *Preservation Officer, Toronto Historical Board*

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ROBERT CHRISTIE, *Manager, Education and Urban Affairs* ROSEMARY COLUCCI, *Policy Analyst, Education and Urban Affairs*

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COVER	MARY FOTE
PAGE 3	CITY OF TORONTO ARCHIVES
PAGE 5	CITY OF TORONTO ARCHIVES
PAGE 12	DR. J.D. MURRAY
PAGE 16	MARY FOTE
PAGE 24	METRO TORONTO AND REGION CONSERVATION AUTHORITY
PAGE 27	ROYAL COMMISSION ON THE FUTURE OF THE TORONTO WATERFRONT
PAGE 30	WILLIAM TIERON
PAGE 31	IBI GROUP
PAGE 37	IBI GROUP
PAGE 38	DIANA JARDINE
PAGE 39	RICHARD RHODES
PAGE 42	RICHARD RHODES
PAGE 43	RICHARD RHODES
PAGE 44	IBI GROUP
PAGE 54	IBI GROUP
PAGE 57	IBI GROUP
PAGE 61	DIANA JARDINE
PAGE 75	METRO TORONTO AND REGION CONSERVATION AUTHORITY
PAGE 76	ROYAL COMMISSION ON THE FUTURE OF THE TORONTO WATERFRONT
PAGE 78	IBI GROUP
PAGE 91	CO-OPERATIVE HOUSING, FEDERATION OF TORONTO
PAGE 92	IBI GROUP
PAGE 93	IBI GROUP
PAGE 95	IBI GROUP
PAGE 96	ROYAL COMMISSION ON THE FUTURE OF THE TORONTO WATERFRONT
PAGE 97	WILLIAM TIERON
PAGE 98	ROYAL COMMISSION ON THE FUTURE OF THE TORONTO WATERFRONT
PAGE 100	IBI GROUP
PAGE 107	IBI GROUP
PAGE 110	DR. J.D. MURRAY
PAGE 117	MARY FOTE